

**DRINKING WATER SURVEILLANCE PROGRAM**

**WALLACEBURG  
WATER TREATMENT  
PLANT**

**REPORT FOR 1991 AND 1992**



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**WALLACEBURG WATER TREATMENT PLANT  
DRINKING WATER SURVEILLANCE PROGRAM  
REPORT FOR 1991 AND 1992**

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## EXECUTIVE SUMMARY

### DRINKING WATER SURVEILLANCE PROGRAM

#### WALLACEBURG WATER TREATMENT PLANT 1991 AND 1992 REPORT

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to include all municipal supplies in Ontario. In 1991, 96 supplies and in 1992, 109 supplies were being monitored.

The Wallaceburg water treatment plant is a conventional treatment plant which treats water from the St. Clair River via the Chenal Ecarte. The process consists of coagulation, flocculation, sedimentation, filtration, taste and odour control and disinfection. Chlorine is added at the mouth of the intake structure for zebra mussel control when the raw water temperature is above 12°C. Chlorine dioxide is generated as part of the disinfection process and powder activated carbon is added on a continuous basis. This plant has a rated capacity of  $11.8 \times 1000 \text{ m}^3/\text{day}$ . The Wallaceburg water treatment plant serves a population of approximately 11,300.

Water at the plant and at two locations in the distribution system was sampled for the presence of approximately 180 parameters. Parameters were divided into the following groups: bacteriological, inorganic and physical (laboratory chemistry, field chemistry and metals), organic (chloroaromatics, chlorophenols, pesticides and PCB, phenolics, polyaromatic hydrocarbons and volatiles) and radiological (radionuclides). Most laboratory analyses were conducted at the Ministry of the Environment and Energy facilities in Rexdale, Ontario. Radionuclides were analyzed by the Ministry of Labour.

Table A is a summary of all results by group.

No known health related guidelines were exceeded.

The Wallaceburg water treatment plant, for the sample years 1991 and 1992, produced good quality water and this was maintained in the distribution system.

TABLE A  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 WALLACEBURG WTP

SUMMARY TABLE BY SCAN

A POSITIVE VALUE DENOTES THAT THE RESULT IS GREATER THAN THE STATISTICAL LIMIT OF DETECTION AND IS QUANTIFIABLE  
A "1" INDICATES THAT NO SAMPLE WAS TAKEN

SCAN	TREATMENT PLANT RAW			TREATMENT PLANT TREATED			DIST. SYSTEM ROBERT ST			DIST. SYSTEM THOMAS AVE		
	TESTS	POSITIVE	%POSITIVE	TESTS	POSITIVE	%POSITIVE	TESTS	POSITIVE	%POSITIVE	TESTS	POSITIVE	%POSITIVE
BACTERIOLOGICAL	30	29	96	12	3	25	11	1	9	7	3	42
CHEMISTRY (FIELD)	36	36	100	72	72	100	130	128	98	84	84	100
CHEMISTRY (LABORATORY)	281	239	85	277	206	74	448	406	90	284	252	88
METALS	288	90	31	288	75	26	506	216	42	322	114	35
CHLOROAROMATICS	140	0	0	140	0	0	112	0	0	70	0	0
CHLOROPHENOLS	24	0	0	24	0	0	0	0	0	0	0	0
PESTICIDES AND PCB	360	0	0	375	0	0	177	0	0	110	0	0
PHENOLICS	12	2	16	11	0	0	0	0	0	0	0	0
POLYAROMATIC HYDROCARBONS	51	0	0	51	0	0	51	0	0	51	0	0
SPECIFIC PESTICIDES	94	0	0	94	0	0	1	0	0	2	0	0
VOLATILES	360	0	0	360	47	13	298	39	13	205	28	13
RADIONUCLIDES	28	6	21	28	7	25	0	0	0	0	0	0
TOTAL	1,704	402		1,732	410		1,734	790		1,135	481	

## **DRINKING WATER SURVEILLANCE PROGRAM**

### **WALLACEBURG WATER TREATMENT PLANT 1991 AND 1992 REPORT**

#### **INTRODUCTION**

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to include all municipal supplies in Ontario. In 1991, 96 supplies and in 1992, 109 supplies were being monitored.

Appendix A has a full description of the DWSP.

The DWSP was initiated for the Wallaceburg water treatment plant in summer of 1985 as part of a survey of the St. Clair/Detroit River area. Previous DWSP annual reports have been published for 1986, 1987, 1988, 1989 and 1990.

#### **PLANT DESCRIPTION**

The Wallaceburg water treatment plant is a conventional treatment plant which treats water from the St. Clair River via the Chenal Ecarte. The process consists of coagulation, flocculation, sedimentation, filtration, taste and odour control and disinfection. Chlorine is added at the mouth of the intake structure for zebra mussel control when the raw water temperature is above 12°C. Chlorine dioxide is generated as part of the disinfection process and powder activated carbon is added on a continuous basis. This plant has a rated capacity of 11.8 x 1000 m<sup>3</sup>/day. The Wallaceburg water treatment plant serves a population of approximately 11,300.

The sample day flows were reported as 9.6 x 1000 m<sup>3</sup>/day.

General plant information is presented in Table 1 and a schematic of plant processes, chemical addition points and sampling locations in Figure 1.

#### **SAMPLING AND ANALYSES**

Stringent DWSP sampling protocols were followed to ensure that all samples were collected in a uniform manner (see Appendix B).

Sample lines in the plant were flushed prior to sampling to ensure that the water obtained was indicative of its origin and not residual water standing in the sample line.

Attempts were made to capture the same block of water at each sampling point by taking the retention time into consideration. Retention time was calculated by dividing the volume of water between two sampling points by sample day flow. For example, if it was determined that retention time within the plant was five hours, then there would be a five hour interval between the raw and treated sampling. Similarly, if it was estimated that it took approximately one day for the water to travel from the plant to the distribution system site, this site would be sampled one day after the treated water from the plant.

To obtain a representative raw water sample, free from any added chemicals, at plants which used chlorine for zebra mussel control, the operator was required to turn off the chlorine feed to the mouth of the intake and allow enough time for the chlorinated water to clear from the intake works.

Plant operating personnel routinely analyzed parameters for process control (Table 2).

At all distribution system locations, two types of samples were obtained, a standing and a free flow. The standing sample consisted of water that had been in the household plumbing and service connection for a minimum of six hours. These samples were used to make an assessment of the change in the levels of inorganic compounds and metals due to leaching from, or deposition on, the plumbing system. The only analyses carried out on the standing samples, therefore, were laboratory chemistry and metals. The free flow sample represented fresh water from the distribution system main, since the sample tap was flushed for five minutes prior to sampling.

Water at the plant and at two locations in the distribution system was sampled for the presence of approximately 180 parameters. Parameters were divided into the following groups: bacteriological, inorganic and physical (laboratory chemistry, field chemistry and metals), organic (chloroaromatics, chlorophenols, pesticides and PCB, phenolics, polyaromatic hydrocarbons and volatiles) and radiological (radionuclides). Most laboratory analyses were conducted at the Ministry of the Environment and Energy facilities in Rexdale, Ontario. Radionuclides were analyzed by the Ministry of Labour.

## **RESULTS**

Field measurements were recorded on the day of sampling and were entered onto the DWSP database as submitted by plant personnel.

Table 3 contains information on delay time between the raw and treated water sampling, flow rate, and treatment chemical dosages.



Table 4 is a summary of all results by parameter and by water type. If a parameter was not detected, the total number of negative sample results is given. In contrast, if a parameter was detected at any location, the detailed results for all samples are provided.

Positive denotes that the result is greater than the statistical limit of detection established by the Ministry of the Environment and Energy laboratory staff and is quantifiable. Trace (<T) denotes that the level measured is greater than the lowest value detectable by the method but lies so close to the detection limit that it cannot be confidently quantified.

Table 5 lists all parameters analyzed in the DWSP.

Associated guidelines and detection limits are also supplied on Tables 4 and 5. Parameters are listed alphabetically within each scan.

## DISCUSSION

### GENERAL

Water quality was judged by comparison with the Ontario Drinking Water Objectives publication (ODWOs). When an Ontario Drinking Water Objective (ODWO) was not available, guidelines/limits from other agencies were used. These guidelines were obtained from the Parameter Listing System database.

The guidelines are evaluated on the results from the free flowing samples. Standing samples in the distribution system can show elevated concentrations in certain metals if the water is corrosive or if the standing time is excessive. Flushing the tap until the water achieves the coolest temperature will ensure that the water used for consumption will contain minimum concentrations of metals.

**IN THIS REPORT, DISCUSSION IS LIMITED TO:**

- THE TREATED AND DISTRIBUTED WATER;**
- ONLY THOSE PARAMETERS WITH CONCENTRATIONS ABOVE  
GUIDELINE VALUES; AND**
- POSITIVE ORGANIC PARAMETERS DETECTED.**

### BACTERIOLOGICAL

Guidelines for bacteriological sampling and testing of a supply are developed to maintain a proper supervision of its bacteriological quality. Routine monitoring programs usually require that multiple samples be collected in a given system. Full interpretation of bacteriological quality cannot be made on the basis of single samples. Standard plate count was the only bacteriological analysis conducted on the treated and distributed water. No results were above the guideline.

## INORGANIC & PHYSICAL

### CHEMISTRY (FIELD)

It is desirable that the temperature of drinking water be less than 15°C. The palatability of water is enhanced by its coolness. A temperature below 15°C will tend to reduce the growth of nuisance organisms and hence minimize associated taste, colour, odour and corrosion problems. The temperature of delivered water may increase in the distribution system due to the warming effect of soil in late summer and fall and/or as a result of higher temperatures in the source water.

Field temperature exceeded the ODWO Aesthetic Objective of 15°C in 9 of 29 treated and distributed water samples with a maximum reported value of 23.0°C.

### CHEMISTRY (LABORATORY)

Colour in drinking water may be due to the presence of natural or synthetic substances as well as certain metallic ions. Colour is measured in Hazen units (HZU).

Colour exceeded the ODWO Aesthetic Objective of 5 HZU in 3 of 30 treated and distributed water samples with a maximum reported value of 8.5 HZU.

Elevated conductivity is often associated with high hardness levels.

Conductivity exceeded the European Economic Community Aesthetic Guideline Level of 400 umho/cm in 2 of 30 treated and distributed water samples with a maximum reported value of 418 umho/cm.

The ODWOs indicate that a hardness level of between 80 and 100 mg/L as calcium carbonate for domestic waters provides an acceptable balance between corrosion and encrustation. Water supplies with a hardness greater than 200 mg/L are considered poor and possess a tendency to form scale deposits and result in excessive soap consumption.

Hardness exceeded the ODWO Recommended Operational Guideline of 80-100 mg/L in 27 of 30 treated and distributed water samples with a maximum reported value of 170.0 mg/L.

### METALS

At present, there is no evidence that aluminum is physiologically harmful and no health limit for drinking water has been specified. The measure of aluminum in treated water is important to measure the efficiency of the treatment process. The ODWOs indicate that a useful guideline is to maintain a residual below 100 ug/L as

aluminum in the water leaving the plant to avoid problems in the distribution system.

Aluminum exceeded the ODWO Recommended Operational Guideline of 100 ug/L in 3 of 30 treated and distributed water samples with a maximum reported value of 190 ug/L.

Iron exceeded the ODWO Aesthetic Objective of 300 ug/L in 1 of 30 treated and distributed water samples with a maximum reported value of 490 ug/L.

Manganese, in high concentrations, can contribute to laundry staining and undesirable tastes.

Manganese exceeded the ODWO Aesthetic Objective of 50.0 ug/L in 1 of 30 treated and distributed water samples with a maximum reported value of 71.0 ug/L.

## ORGANIC

### CHLOROAROMATICS

The results of the chloroaromatic scan showed that none were detected above trace levels.

### CHLOROPHENOLS

The results of the chlorophenol scan showed that none were detected.

### PESTICIDES AND PCB

The results of the pesticide and PCB scan showed that none were detected above trace levels.

### PHENOLICS

The results of the phenolics test showed that none were detected above trace levels.

### POLYAROMATIC HYDROCARBONS

The results of the polyaromatic hydrocarbon scan showed that none were detected.

### SPECIFIC PESTICIDES

The results of the specific pesticide scan showed that none were detected.

## VOLATILES

The detection of benzene, ethylbenzene, toluene and xylenes at low, trace levels may be a laboratory artifact derived from the analytical methodology. Trace levels of styrene are considered to be laboratory artifacts resulting from the sample shipping containers.

Trihalomethanes (THMs) are produced during the water treatment process and will always occur in chlorinated waters. THMs are comprised of chloroform, chlorodibromomethane and dichlorobromomethane. Bromoform occurs occasionally. Results are reported for the individual compounds as well as for total THMs. Only total THM results are discussed. Starting in 1991, samples from the distribution system were quenched with sodium thiosulphate to stop the further production of THMs in the sample bottle. This provided a more representative estimation of the THMs consumed in tap water.

Total trihalomethanes were found at positive levels in all 29 treated and distributed water samples analyzed with a maximum level of 39.5 ug/L. This was below the ODWO Maximum Acceptable Concentration of 350 ug/L.

## RADIOLOGICAL

### RADIONUCLIDES

There are more than 200 radionuclides, some of which occur naturally and others which originate from the activities of society. The radionuclides currently of greater interest from a health view-point are tritium, strontium-90, iodine-131, cesium-137 and radium-226. The gross beta and gross alpha determinations are suitable for preliminary screening except for tritium which must be measured separately. Radionuclides are measured in becquerels per litre (Bq/L). No results were above the available guidelines.

## CONCLUSIONS

No known health related guidelines were exceeded.

The Wallaceburg water treatment plant, for the sample years 1991 and 1992, produced good quality water and this was maintained in the distribution system.

# FIGURE 1 WALLACEBURG WATER TREATMENT PLANT

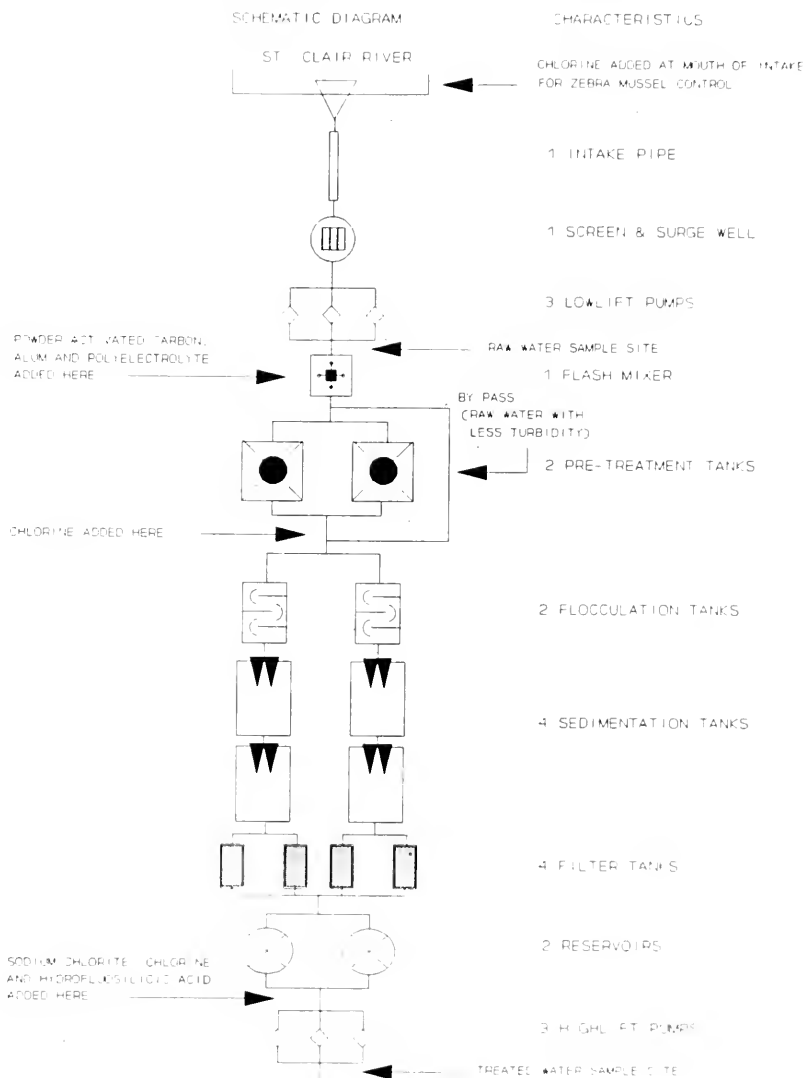


TABLE 1  
DRINKING WATER SURVEILLANCE PROGRAM  
PLANT GENERAL REPORT

PLANT NAME: WALLACEBURG WTP  
WORKS #: 220003341  
UTM #: 173833904713920

DISTRICT: SARNIA  
REGION: SOUTHWEST  
DISTRICT OFFICER: O. WIGLE

SUPERINTENDENT: LEO DENYS

ADDRESS: LIBBY RD.  
WALLACEBURG, ONTARIO  
519-627-4191

MUNICIPALITY: WALLACEBURG  
AUTHORITY: MUNICIPAL

PLANT INFORMATION

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PLANT VOLUME:	5.817	(X 1000 M3)
DESIGN CAPACITY:	13.500	(X 1000 M3/DAY)
RATED CAPACITY:	11.820	(X 1000 M3/DAY)

MUNICIPALITY	POPULATION
-----	-----
WALLACEBURG	11,295

TABLE 2  
DRINKING WATER SURVEILLANCE PROGRAM  
IN-PLANT MONITORING

PARAMETER -----	LOCATION -----	FREQUENCY -----
FREE CHLORINE RESIDUAL	TREATED	HOURLY
FLUORIDE	TREATED	2 TIMES/DAY
PH	TREATED	2 TIMES/DAY
TEMPERATURE	TREATED	HOURLY
TURBIDITY	RAW	HOURLY
	TREATED	HOURLY

TABLE 3  
DRINKING WATER SURVEILLANCE PROGRAM WALLACEBURG WTP SAMPLE DAY CONDITIONS  
AND TREATMENT CHEMICAL DOSAGES FOR 1991 AND 1992

DATE	DELAY * TIME(HRS) (1000W3)	FLOW	PRE CHLORINATION CHLORINE	COAGULATION ALUM LIQUID	TASTE AND ODOR ACTIVATED CARBON POWDER	POST CHLORINATION CHLORINE	SODIUM CHLORIDE	COAGULATION AID POLYELECTROLYTE
91 JAN 16 13.00	9.682	1.00		15.00	5.00	.38		
91 MAR 13 13.00	9.682	1.00		15.00	5.00		.38	
91 MAY 15 13.00	9.682	1.03		15.00	5.00		.35	
91 JUL 10 13.00	9.682	.92		15.00	5.00		.35	
91 SEP 11 13.00	9.682	.40		15.00			1.10	
91 NOV 14 13.00	9.682	.40		15.00	5.00		1.02	
92 FEB 12 13.00	9.682	.40		8.50	5.00		1.00	.25
92 JUN 10 13.00	9.682	1.01		15.00	5.00			
92 AUG 19 13.00	9.682	1.01		15.00	5.00			
92 OCT 15 13.00	9.682	1.01		15.00	5.00			
92 DEC 16 13.00	9.682	1.04		15.00	5.00			

\* THE DELAY TIME BETWEEN THE RAW AND TREATED WATER SAMPLING, SHOULD ESTIMATE THE RETENTION TIME.



KEY TO TABLE 4 and 5

- A     ONTARIO DRINKING WATER OBJECTIVES (ODWO)
1.   Maximum Acceptable Concentration (MAC)
  - 1+.  MAC for Total Trihalomethanes
  2.   Interim Maximum Acceptable Concentration (IMAC)
  3.   Aesthetic Objective (AO)
  - 3\*.  AO for Total Xylenes
  4.   Recommended Operational Guideline
  5.   Health Related Guidance Value
- B     HEALTH & WELFARE CANADA (H&W)
1.   Maximum Acceptable Concentration (MAC)
  2.   Proposed MAC
  3.   Interim MAC
  4.   Aesthetic Objective (AO)
- C     WORLD HEALTH ORGANIZATION (WHO)
1.   Guideline Value (GV)
  2.   Tentative GV
  3.   Aesthetic GV
- D     US ENVIRONMENTAL PROTECTION AGENCY (EPA)
1.   Maximum Contaminant Level (MCL)
  2.   Suggested No-Adverse Effect Level (SNAEL)
  3.   Lifetime Health Advisory
  4.   EPA Ambient Water Quality Criteria
- F     EUROPEAN ECONOMIC COMMUNITY (EEC)
1.   Health Related Guideline Level
  2.   Aesthetic Guideline Level
  3.   Maximum Admissable Concentration (MADC)
- G     CALIFORNIA STATE DEPARTMENT OF HEALTH-GUIDELINE VALUE
- I     NEW YORK STATE AMBIENT WATER GUIDELINE
- N/A   NONE AVAILABLE

LABORATORY RESULTS, REMARK DESCRIPTIONS

. No Sample Taken

BDL Below Minimum Measurement Amount

<T Greater Than Detection Limit But Not Confident  
(SEE INTERPRETATION OF RESULTS ABOVE)

> Results Are Greater Than The Upper Limit

<=> Approximate Result

!48 No Data: Sample Age Exceeded 48 Hours

!AR No Data: No Numeric Results

!AW No Data: Analysis Withdrawn

!BT No Data: Sample Broken In Transit

!CS No Data: Contamination Suspected

!EF No Data: Laboratory Equipment Failure

!IR No Data: Insufficient Sample

!IS No Data: Insufficient Sample

!LA No Data: Laboratory Accident

!NP No Data: No Procedure

!NR No Data: Sample Not Received

!OP No Data: Obscured Plate

!PE No Data: Procedure Error: Sample Discarded

!PR No Data: Preservative Required

!QU No Data: Quality Control Unacceptable

!RE No Data: Received Empty

!RO No Data: No Numeric Results

!SM No Data: Sample Missing

!SS No Data: Sample Improperly Preserved

!U No Data: Sample Unsuitable For Analysis

!UB No Data: Bottle Broken

!UN No Data: Result Unreliable

!OK	NO Data. Unpreserved Sample Required
A	Approximate Value
A3C	Approximate, Total Count Exceeded 300 Colonies
A>	Approximate Value, Exceeded Normal Range
APS	Additional Peak, Less Than, Not Priority Pollutant
ARO	Additional Information In Laboratory Report
CRO	Calculated Result Only
NAF	Not All Required Tests Found
RID	Ioncal Calculated on Incomplete Data Set
RMP	P and M-Xylene Not Separated
RRR	Result Obtained by Repeat Analysis
RRV	Rerun Verification
SFA	Sample Filtered: Filtrate Analyzed
SIL	Sample Incorrectly Labelled
SPS	Several Peaks, Small, Not Priority Pollutant
U48	Unreliable: Sample Age Exceeded 48 Hours
UAL	Unreliable: Sample Age Exceeded Limit
UAU	Unreliable: Sample Age Unknown
UCS	Unreliable: Contamination Suspected
WSD	Wrong Sample Description On Bottle

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 WALLACEBURG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM ROBERT ST FREE FLOW	DIST. SYSTEM ROBERT ST STANDING	DIST. SYSTEM THOMAS AVE FREE FLOW	DIST. SYSTEM THOMAS AVE STANDING
BACTERIOLOGICAL					
FECAL COLIFORM MF (CT/100ML)	DET'N LIMIT = 0	GUIDELINE = 0 (A1)			
1991 JAN	68	.	.	.	.
1991 JUL	76	.	.	.	.
1991 SEP	40	.	.	.	.
1991 NOV	76	.	.	.	.
1992 FEB	160	.	.	.	.
1992 APR	8	.	.	.	.
1992 JUN	8	.	.	.	.
1992 AUG	26	.	.	.	.
1992 OCT	10	.	.	.	.
1992 DEC	14	.	.	.	.
STANDARD PLATE CNT MF (CT/ML)					
1991 JAN	2 <=>	0 <=>	.	1 <=>	.
1991 MAR	0 <=>	1 <=>	.	4 <=>	.
1991 MAY	12	4 <=>	.	10	.
1991 JUL	0 <=>	4 <=>	.	330	.
1991 SEP	1 <=>	1 <=>	.	19	.
1991 NOV	0 <=>	1 <=>	.	0 <=>	.
1992 FEB	0 <=>	1 <=>	.	0 <=>	.
1992 APR	0 <=>	0 <=>	.	0 <=>	.
1992 JUN	20	7 <=>	.	.	.
1992 AUG	290	47	.	.	.
1992 OCT	2	1 <=>	.	.	.
1992 DEC	2 <=>	1 <=>	.	.	.
TOTAL COLIFORM MF (CT/100ML)					
1991 JAN	610 A3C	GUIDELINE = 5/100ML (A1)			
1991 JUL	400 <=>	.	.	.	.
1991 SEP	500 A3C	.	.	.	.
1991 NOV	2200 A3C	.	.	.	.
1992 FEB	44,000 A3C	.	.	.	.
1992 APR	230	.	.	.	.
1992 JUN	620 A3C	.	.	.	.
1992 AUG	500 A3C	.	.	.	.
1992 OCT	400 A3C	.	.	.	.
1992 DEC	1800	.	.	.	.

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 WALLACEBURG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM ROBERT ST FREE FLOW	DIST. SYSTEM ROBERT ST STANDING	DIST. SYSTEM THOMAS AVE FREE FLOW	DIST. SYSTEM THOMAS AVE STANDING
BACTERIOLOGICAL					
T COLIFORM BCKGRD MF (CT/100ML)		DET'N LIMIT = 0	GUIDELINE = N/A		
1991 JAN	4200	-	-	-	-
1991 JUL	48000 A3C	-	-	-	-
1991 SEP	26000 A3C	-	-	-	-
1991 NOV	35000 A3C	-	-	-	-
1992 FEB	20000 A3C	-	-	-	-
1992 APR	950	-	-	-	-
1992 JUN	3800 A3C	-	-	-	-
1992 AUG	9000 A3C	-	-	-	-
1992 OCT	13400 A3C	-	-	-	-
1992 DEC	18000	-	-	-	-

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 WALLACEBURG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM ROBERT ST FREE FLOW	DIST. SYSTEM ROBERT ST STANDING	DIST. SYSTEM THOMAS AVE FREE FLOW	DIST. SYSTEM THOMAS AVE STANDING
CHEMISTRY (FIELD)					
FLD CHLORINE (COMB) (MG/L)		DET'N LIMIT = 0		GUIDELINE = N/A	
1991 JAN	.100	.050	.100	.050	.100
1991 MAR	.100	.050	.050	.050	.050
1991 MAY	.150	.050	.050	.050	.050
1991 JUL	.150	.050	.050	.050	.050
1991 SEP	.200	.050	.050	.050	.050
1991 NOV	.400	.050	.100	.050	.050
1992 FEB	.020	.050	.100	.050	.050
1992 APR	.100	.050	.050	.100	.200
1992 JUN	.100	.050	.050	.050	.050
1992 AUG	.100	.050	.050	.050	.050
1992 OCT	.100	.000	.000	.000	.050
1992 DEC	.100	.100	.050	.050	.050
FLD CHLORINE FREE (MG/L)		DET'N LIMIT = 0		GUIDELINE = N/A	
1991 JAN	1.000	.250	.050	.300	.100
1991 MAR	1.000	.200	.100	.150	.100
1991 MAY	1.030	.200	.100	.300	.100
1991 JUL	.900	.150	.050	.150	.100
1991 SEP	1.000	.150	.100	.150	.100
1991 NOV	.900	.300	.100	.250	.050
1992 FEB	.900	.200	.100	.050	.050
1992 APR	1.000	.150	.100	.150	.050
1992 JUN	1.000	.150	.100	.050	.050
1992 AUG	1.000	.150	.100	.050	.050
1992 OCT	1.000	.050	.050	.050	.050
1992 DEC	1.100	.100	.050	.050	.050
FLD CHLORINE (TOTAL) (MG/L)		DET'N LIMIT = 0		GUIDELINE = N/A	
1991 JAN	1.100	.300	.150	.350	.200
1991 MAR	1.100	.250	.150	.200	.150
1991 MAY	1.150	.250	.150	.350	.150
1991 JUL	1.050	.200	.100	.200	.150
1991 SEP	2.000	.200	.150	.200	.150
1991 NOV	1.300	.350	.200	.300	.100
1992 FEB	.920	.250	.200	.050	.050
1992 APR	1.100	.200	.150	.250	.250
1992 JUN	1.100	.200	.150	.050	.050
1992 AUG	1.100	.200	.150	.050	.050
1992 OCT	1.100	.050	.050	.050	.050
1992 DEC	1.200	.200	.100	.050	.050

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 WALLACEBURG WTP

TABLE 4 DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 WALLACBURG WTP									
TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM ROBERT ST		DIST. SYSTEM ROBERT ST STANDING	DIST. SYSTEM THOMAS AVE		DIST. SYSTEM THOMAS AVE STANDING		
		FREE FLOW	STANDING		FREE FLOW	STANDING			
CHEMISTRY (FIELD)									
FLD PH (OMNSLESS)		DET'N LIMIT = N/A		GUIDELINE = 6.5-8.5 (A4)					
1991 JAN	7.400	7.000	7.200	7.000	7.100	7.000	7.200		
1991 MAR	7.400	7.000	7.000	6.800	6.900	7.000	7.000		
1991 MAY	7.300	7.000	7.000	7.200	7.200	7.200	7.200		
1991 JUL	7.300	7.000	7.000	7.200	7.200	7.200	7.400		
1991 SEP	7.500	7.300	7.400	7.200	7.500	7.300	7.200		
1991 NOV	7.800	7.200	7.400	7.200	7.300	7.300	7.200		
1992 FEB	7.400	6.800	6.800	6.800					
1992 APR	8.200	7.600	7.200	7.500	7.000	7.000	7.200		
1992 JUN	7.500	7.200	7.400	7.600					
1992 AUG	7.700	7.300	7.400	7.600					
1992 OCT	7.500	7.300	7.200	7.200					
1992 DEC	7.400	7.200	7.400	7.400					
FLD TEMPERATURE (DEG.C)									
		DET'N LIMIT = N/A		GUIDELINE = 15 (A3)					
1991 JAN	2.000	3.000	6.000	7.000	8.000	8.000	12.000		
1991 MAR	2.000	5.000	6.000	5.000	5.000	5.000	15.000		
1991 MAY	12.000	10.000	8.000	11.000	14.000	14.000	16.000		
1991 JUL	20.000	20.000			22.000	20.000	21.000		
1991 SEP	22.000	22.000	23.000	18.000	20.000	20.000	20.000		
1991 NOV	8.000	8.000	13.000	12.000	14.000	14.000	13.000		
1992 FEB	2.000	3.000	6.000	9.000					
1992 APR	2.000	3.000	16.000	15.000	8.000	8.000	13.000		
1992 JUN	13.000	13.000	22.000	20.000					
1992 AUG	18.500	18.500	17.000	20.000					
1992 OCT	14.000	14.000	8.000	17.000					
1992 DEC	6.000	7.000		12.000					
FLD TURBIDITY (FTU)									
		DET'N LIMIT = N/A		GUIDELINE = 1.0 (A1)					
1991 JAN	4.00	.190	.980	1.600	.540	.540	.880		
1991 MAR	3.700	.190	1.100	1.700	.870	.870	.900		
1991 MAY	4.700	.140	.600	.850	.150	.150	.160		
1991 JUL	5.000	.120	.720	.190	.850	.850	.420		
1991 SEP	4.700	.150	.660	.630	.560	.560	.460		
1991 NOV	1.500	.130	.600	.400	.400	.400	1.000		
1992 FEB	95.000	.600	2.000	3.000					
1992 APR	5.500	.130	.550	.500	.280	.280	.540		
1992 JUN	4.000	.080	.090	.090					
1992 AUG	3.500	.120	.630	1.500					
1992 OCT	3.000	.090	1.000	1.900					
1992 DEC	2.000	.110							

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 WALLACEBURG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM ROBERT ST FREE FLOW	DIST. SYSTEM STANDING	DIST. SYSTEM THOMAS AVE FREE FLOW	DIST. SYSTEM STANDING
CHEMISTRY (LABORATORY)					
ALKALINITY (MG/L)					
DET'N LIMIT = 0.2					
GUIDELINE = 30-500 (A4)					
1991 JAN	84,900	73,600	74,000	74,200	74,100
1991 MAR	89,700	77,800	79,900	79,700	81,400
1991 MAY	87,200	75,000	75,700	76,000	77,000
1991 JUL	86,600	74,300	75,400	75,700	75,500
1991 SEP	86,600	75,500	76,400	76,800	76,700
1991 NOV	84,500	72,000	73,400	73,900	74,100
1992 FEB	95,300	49,500	60,000		
1992 APR	82,100	73,100		73,000	72,200
1992 JUN	90,300	77,200	79,400		
1992 AUG	82,600	76,200	76,700		
1992 OCT	83,800	72,700	70,300		
1992 DEC	84,100	73,300	74,700		
CALCIUM (MG/L)					
DET'N LIMIT = 0.20					
GUIDELINE = 100 (F2)					
1991 JAN	29,300	29,000	30,400	30,000	29,800
1991 MAR	30,700	31,800	32,700	32,000	33,300
1991 MAY	29,000	29,800	28,900	29,600	30,400
1991 JUL	28,900	29,200	29,400	29,500	29,400
1991 SEP	26,200	27,200	27,600	27,400	27,300
1991 NOV	26,800	27,300	29,800	29,800	30,200
1992 FEB	52,800	49,900	50,200		
1992 APR	27,200	27,700		27,750	27,800
1992 JUN	29,000	29,600			
1992 AUG	27,300	29,150	29,300		
1992 OCT	28,400	29,700	29,700		
1992 DEC	27,250	28,250	28,350		
CYANIDE (MG/L)					
DET'N LIMIT = 0.001					
GUIDELINE = 0.2 (A1)					
16 SAMPLES					
BOL					
CHLORIDE (MG/L)					
DET'N LIMIT = 0.20					
GUIDELINE = 250 (A3)					
1991 JAN	8,100	9,600	12,700	11,300	9,400
1991 MAR	9,000	11,700	12,000	10,500	11,500
1991 MAY	10,300	12,300	12,500	14,100	13,800
1991 JUL	11,200	11,500	11,500	11,300	11,400
1991 SEP	8,200	10,500	10,600	10,300	10,700
1991 NOV	7,800	9,500	10,000	9,900	9,600
1992 FEB	21,400	21,300	22,300		
1992 APR	10,300	11,400		11,900	11,800
1992 JUN	10,200	11,800	11,500		
1992 AUG	8,900	11,700	11,800		
1992 OCT	9,100	11,100	11,200		
1992 DEC	9,300	11,000	11,300		



TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 WALLACEBURG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM ROBERT ST FREE FLOW	DIST. SYSTEM ROBERT ST STANDING	DIST. SYSTEM THOMAS AVE FREE FLOW	DIST. SYSTEM THOMAS AVE STANDING
CHEMISTRY (LABORATORY)					
COLOUR (HZU)		DET'N LIMIT = 0.50		GUIDELINE = 5 (A3)	
1991 JAN	BOL	2,500	6,500	1,000 <T	1,000 <T
1991 MAR	BOL	5,500	5,000	3,500	4,000
1991 MAY	1,000 <T	2,000 <T	2,500	1,500 <T	1,000 <T
1991 JUL	1,500 <T	3,500	2,500	2,000	1,000 <T
1991 SEP	1,500 <T	1,500	1,500	1,500 <T	1,500 <T
1991 NOV	1,500 <T	2,000	2,500	2,000	3,000
1992 FEB	13,500	8,500	8,500	1,500	1,500
1992 APR	4,000	3,500	3,000	3,000	-
1992 JUN	BOL	3,000	3,000	1,000	-
1992 AUG	2,000	4,000	1,000	-	-
1992 OCT	1,500 <T	6,000	10,000	-	-
1992 DEC	1,500 <T				
CONDUCTIVITY (UMHO/CM)					
		DET'N LIMIT = 1.0		GUIDELINE = 400 (F2)	
1991 JAN	225	237	234	236	232
1991 MAR	231	258	266	259	274
1991 MAY	228	237	236	237	238
1991 JUL	228	236	238	237	239
1991 SEP	224	234	237	236	237
1991 NOV	222	229	231	232	231
1992 FEB	390	418	409	234	232
1992 APR	228	238	246	-	-
1992 JUN	239	245	244	-	-
1992 AUG	228	240	237	-	-
1992 OCT	221	231	232	-	-
1992 DEC	227	233	232	-	-
DISS ORG CARBON (MG/L)					
		DET'N LIMIT = 0.10		GUIDELINE = 5.0 (A3)	
1991 JAN	1,600	1,300	1,500	1,200	1,100
1991 MAR	1,700	1,500	2,100	1,100	1,300
1991 MAY	1,500	1,000	1,000	1,000	1,000
1991 JUL	1,500	1,000	1,300	1,000	1,000
1991 SEP	1,500	1,200	1,500	1,400	1,300
1991 NOV	1,400	1,000	1,200	1,000	1,100
1992 FEB	6,400	2,100	2,900	-	-
1992 APR	1,400	1,000	1,100	1,000	1,200
1992 JUN	1,700	1,000	1,100	-	-
1992 AUG	1,500	1,100	1,200	-	-
1992 OCT	1,300	1,000	1,100	-	-
1992 DEC	1,400	1,000	1,200	-	-

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 WALLACEBURG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM ROBERT ST FREE FLOW	DIST. SYSTEM STANDING	DIST. SYSTEM THOMAS AVE FREE FLOW	DIST. SYSTEM THOMAS AVE STANDING
CHEMISTRY (LABORATORY)					
FLUORIDE (MG/L)		DET'N LIMIT = 0.01		GUIDELINE = 1.5 (A1)	
1991 JAN	.080	.960	.940	.960	.960
1991 MAR	.080	.820	.820	.820	.820
1991 MAY	.080	.920	.920	.840	.880
1991 JUL	.080	1.160	1.040	1.060	1.000
1991 SEP	.060	1.020	.960	1.040	.980
1991 NOV	.080	1.160	1.120	1.120	1.060
1992 FEB	.180	1.120	.920	.	.900
1992 APR	.080	.960	.860	.	.
1992 JUN	.120	1.040	1.040	.	.
1992 AUG	.080	1.080	1.200	.	.
1992 OCT	.080	1.320	1.080	.	.
1992 DEC	.080	1.000	1.020	.	.
HARDNESS (MG/L)					
		DET'N LIMIT = 0.5		GUIDELINE = 80-100 (A4)	
1991 JAN	103.900	102.000	107.000	104.000	104.000
1991 MAR	108.600	111.700	115.100	113.300	117.400
1991 MAY	105.000	105.700	103.900	105.800	107.100
1991 JUL	102.400	103.400	104.200	105.200	105.100
1991 SEP	97.700	100.800	101.900	101.700	101.300
1991 NOV	99.500	98.400	106.000	106.000	106.800
1992 FEB	174.000	163.000	165.000	.	.
1992 APR	98.100	100.000	.	100.200	100.200
1992 JUN	105.000	106.000	106.000	.	.
1992 AUG	99.030	104.280	104.110	.	.
1992 OCT	102.000	105.000	105.000	.	.
1992 DEC	98.780	101.930	101.890	.	.
IONCAL (CMH/LESS)					
		DET'N LIMIT = N/A		GUIDELINE = N/A	
1991 JAN	1.782	3.423	1.291	2.625	1.258
1991 MAR	.914	1.743	1.743	2.641	1.581
1991 MAY	.190	1.481	1.092	.095	.855
1991 JUL	4.314	.272	.846	.033	.321
1991 SEP	6.168	1.882	4.957	2.252	2.651
1991 NOV	5.096	1.748	4.354	3.697	4.154
1992 FEB	.134 RID	1.183	1.576	2.175	.
1992 APR	1.134	.647	.167	.607	.968 NAF
1992 JUN	2.937	1.056	1.789	2.070	.
1992 AUG	.890	.712	2.161	.356	.
1992 OCT	.224	3.244	1.295	.584	.
1992 DEC	2.946	.731	.	.	.

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 WALLACEBURG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM FREE FLOW	DIST. SYSTEM STANDING	DIST. SYSTEM THOMAS AVE FREE FLOW	DIST. SYSTEM THOMAS AVE STANDING
CHEMISTRY (LABORATORY)					
POTASSIUM (MG/L)		DET'N LIMIT = 0.01		GUIDELINE = 10 (F2)	
1991 JAN	.890	.930			.950
1991 MAR	.990	.970	1.200	.950	1.100
1991 MAY	1.030	1.040	1.170	1.040	1.050
1991 JUL	1.090	.960	1.060	1.020	.920
1991 SEP	.940	.950	1.120	.950	.890
1991 NOV	.960	.930	.950	.650	.800
1992 FEB	2.940	2.690	2.730		.926
1992 APR	.970	.900		.920	
1992 JUN	.980	.920	1.070		
1992 AUG	.982	.947	.969		
1992 OCT	.900	.960	.920		
1992 DEC	.947	.931	.945		
LANGLIERS INDEX (OMNLESS)					
		DET'N LIMIT = N/A		GUIDELINE = N/A	
1991 JAN	.216	.129	.011	.067	.048
1991 MAR	.308	.158	.031	.054	.084
1991 MAY	.202	.139	.023	.012	.005
1991 JUL	.267	.188	.019	.125	.109
1991 SEP	.246	.041	.013	.022	.027
1991 NOV	.086	.058	.062	.070	.102
1992 FEB	.472 RID	.307	.253		.060
1992 APR	.268	.132		.077	
1992 JUN	.393	.125	.213		
1992 AUG	.312	.098	.114		
1992 OCT	.118	.028	.195		
1992 DEC	.120	.334	.077		
MAGNESIUM (MG/L)					
		DET'N LIMIT = 0.1		GUIDELINE = 30.0 (F2)	
1991 JAN	7.500	7.450	7.500	7.200	7.200
1991 MAR	7.750	7.950	8.150	8.150	8.350
1991 MAY	7.900	7.850	7.750	7.750	7.550
1991 JUL	7.350	7.600	7.500	7.650	7.700
1991 SEP	7.850	7.950	7.990	8.050	8.010
1991 NOV	7.400	7.300	7.500	7.600	7.600
1992 FEB	10.300	9.420	9.660		
1992 APR	7.330	7.380		7.510	7.490
1992 JUN	7.940	7.840	7.850		
1992 AUG	7.510	7.490	7.530		
1992 OCT	7.540	7.570	7.560		
1992 DEC	7.480	7.590	7.550		

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 WALLACEBURG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM FREE FLOW	DIST. SYSTEM ROBERT ST STANDING	DIST. SYSTEM THOMAS AVE FREE FLOW	DIST. SYSTEM THOMAS AVE STANDING
CHEMISTRY (LABORATORY)					
SODIUM (MG/L)		DET'N LIMIT = 0.20		GUIDELINE = 200 (A4)	
1991 JAN	5,400	5,800	4,800	5,000	4,600
1991 MAR	5,800	6,200	6,400	6,200	6,400
1991 MAY	6,300	6,600	6,700	6,600	6,800
1991 JUL	5,800	5,900	5,900	5,800	5,800
1991 SEP	5,100	6,000	6,100	6,100	6,100
1991 NOV	4,900	5,300	5,000	5,200	5,000
1992 FEB	7,660	7,660	8,820	.	5,000
1992 APR	6,690	6,330	6,400	6,540	6,540
1992 JUN	6,200	6,170	6,400	.	.
1992 AUG	5,590	6,560	6,650	.	.
1992 OCT	5,470	5,700	5,800	.	.
1992 DEC	5,610	5,580	5,590	.	.
AMMONIUM TOTAL (MG/L)		DET'N LIMIT = 0.002		GUIDELINE = 0.05 (F2)	
1991 JAN	.006 <T	BDL	.022	BDL	BDL
1991 MAR	.008 <T	.002 <T	BDL	.016	.018
1991 MAY	.024	BDL	.008 <T	BDL	BDL
1991 JUL	.020	.004 <T	.002 <T	.010	.006 <T
1991 SEP	.016	.008 <T	BDL	.004 <T	.010
1991 NOV	.010	.002 <T	BDL	BDL	BDL
1992 FEB	.014	.028	.032	.	.
1992 APR	.008 <T	BDL	.008 <T	.006 <T	BDL
1992 JUN	.018	.004 <T	.010	.	.
1992 AUG	.004 <T	.004 <T	.042	.	.
1992 OCT	.010	.006 <T	.002 <T	.	.
1992 DEC	.004 <T	BDL	.	.	.
NITRITE (MG/L)		DET'N LIMIT = 0.001		GUIDELINE = 1.0 (A1)	
1991 JAN	.002 <T	BDL	.001 <T	BDL	BDL
1991 MAR	.002 <T	BDL	.002 <T	BDL	BDL
1991 MAY	.003 <T	BDL	.001 <T	.001 <T	BDL
1991 JUL	.005	.001 <T	.003 <T	.002 <T	.001 <T
1991 SEP	.005	.003 <T	.002 <T	.002 <T	.002 <T
1991 NOV	.001 <T	BDL	BDL	BDL	BDL
1992 FEB	.099	.001 <T	.004 <T	.	.
1992 APR	.005	BDL	.003 <T	.004 <T	.003 <T
1992 JUN	.008	.002 <T	.003 <T	.	.
1992 AUG	.008	.001 <T	.002 <T	.	.
1992 OCT	.004 <T	BDL	.002 <T	.	.
1992 DEC	.002 <T	BDL	.003 <T	.	.

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 WALLACEBURG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	CHEMISTRY (LABORATORY)				DIST. SYSTEM ROBERT ST STANDING	DIST. SYSTEM THOMAS AVE FREE FLOW	DIST. SYSTEM THOMAS AVE STANDING	
		NITRATE (TOTAL) (MG/L )							
1991 JAN	.355	.350	.340	.350	.340	.350	.340	.335	
1991 MAR	.435	.575	.660	.720	.620	.720	.620	.895	
1991 MAY	.380	.395	.380	.395	.390	.395	.390	.395	
1991 JUL	.325	.345	.330	.330	.320	.330	.320	.335	
1991 SEP	.260	.265	.255	.260	.260	.260	.260	.265	
1991 NOV	.290	.295	.295	.300	.300	.300	.300	.300	
1992 FEB	9.350	9.050	7.850	7.680		7.680		.380	
1992 APR	.395	.400	.430	.425		.425			
1992 JUN	.445	.455	.340	.340		.340			
1992 AUG	.375	.375	.280	.290		.290			
1992 OCT	.300	.305	.330	.320		.320			
1992 DEC	.315	.320							
NITROGEN TOT KJELD (MG/L )									
DET'N LIMIT = 0.02      GUIDELINE = N/A									
1991 JAN	.200	.090 <T	.110	.300	.090 <T		.090 <T	.110	
1991 MAR	.160	.100	.080 <T	.230	.110		.110	.110	
1991 MAY	.180	.080 <T	.130	.120	.130		.130	.120	
1991 JUL	.220	.120	.120	.180	.180		.180	.100	
1991 SEP	.200	.090 <T	.100	.300	.110		.110	.110	
1991 NOV	.180	.100	.100	.230	.110		.110	.100	
1992 FEB	1.180	.440	.360	.580					
1992 APR	.180	.120			.120		.120	.120	
1992 JUN	.240	.120	.130	.240					
1992 AUG	.190	.100	.100	.120					
1992 OCT	.170	.070 <T	.090 <T	.200					
1992 DEC	.160	.080 <T	.100	.140					
PH (DMNSLESS )									
DET'N LIMIT = N/A      GUIDELINE = 6.5-8.5 (A4)									
1991 JAN	8.230	7.950	7.960	8.050	8.000	8.000	8.000	8.020	
1991 MAR	8.280	7.880	8.040	8.040	8.070	8.070	8.070	8.080	
1991 MAY	8.210	7.930	8.000	8.100	8.050	8.050	8.050	8.050	
1991 JUL	8.280	7.890	7.890	8.050	7.940	7.940	7.940	7.960	
1991 SEP	8.300	8.060	8.100	8.110	8.090	8.090	8.090	8.120	
1991 NOV	8.140	8.060	7.890	8.010	8.000	8.000	8.000	7.960	
1992 FEB	8.220	7.730	7.410	7.720					
1992 APR	8.330	8.240		8.030		8.030		8.050	
1992 JUN	8.390	8.190	8.210	8.260		8.260			
1992 AUG	8.370	7.990	8.240	8.180		8.180			
1992 OCT	8.150	8.060	8.050	7.900		7.900			
1992 DEC	8.170	7.760	7.940	8.010		8.010			

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 WALLACEBURG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM ROBERT ST FREE FLOW	DIST. SYSTEM ROBERT ST STANDING	DIST. SYSTEM THOMAS AVE FREE FLOW	DIST. SYSTEM THOMAS AVE STANDING
CHEMISTRY (LABORATORY)					
PHOSPHORUS FIL REACT (MG/L)		DET'N LIMIT = 0.0005		GUIDELINE = N/A	
1991 JAN	.001 <T	.000 <T			
1991 MAR	.001 <T	.001 <T			
1991 MAY	.001 <T	.001 <T			
1991 JUL	.000 <T	.000 <T			
1991 SEP	.001 <T	.000 <T			
1991 NOV	.001 <T	.001 <T			
1992 FEB	.128	.001 <T			
1992 APR	.002 <T	.001 <T			
1992 JUN	.001 <T	.001 <T			
1992 AUG	.006	.001 <T			
1992 OCT	.001 <T	.001 <T			
1992 DEC	.001 <T	.002 <T			
PHOSPHORUS TOTAL (MG/L)		DET'N LIMIT = 0.002		GUIDELINE = 0.40 (F2)	
1991 JAN	.009 <T	.002 <T			
1991 MAR	.004 <T	.001 <T			
1991 MAY	.008 <T	.002 <T			
1991 JUL	.010	.002 <T			
1991 SEP	.012	.003 <T			
1991 NOV	.004 <T	.001 <T			
1992 FEB	.320	.004 <T			
1992 APR	.006 <T	.001 <T			
1992 JUN	.011	.002 <T			
1992 AUG	.016	.002 <T			
1992 OCT	.010	.002 <T			
1992 DEC	.008 <T	.003 <T			
RESIDUE FILTRATE (MG/L)		DET'N LIMIT = N/A		GUIDELINE = 500 (A3)	
1991 JAN	146.000 CRO	151.000 CRO	152.000 CRO	153.000 CRO	151.000 CRO
1991 MAR	150.000 CRO	166.000 CRO	173.000 CRO	168.000 CRO	178.000 CRO
1991 MAY	148.000 CRO	154.000 CRO	153.000 CRO	154.000 CRO	155.000 CRO
1991 JUL	148.000 CRO	153.000 CRO	155.000 CRO	154.000 CRO	155.000 CRO
1991 SEP	146.000 CRO	152.000 CRO	154.000 CRO	153.000 CRO	154.000 CRO
1991 NOV	144.000 CRO	149.000 CRO	150.000 CRO	151.000 CRO	150.000 CRO
1992 FEB	253.000 CRO	272.000 CRO	266.000 CRO		
1992 APR	148.000 CRO	159.000 CRO		202.000 CRO	151.000 CRO
1992 JUN	155.000 CRO	159.000 CRO	160.000 CRO		
1992 AUG	148.000 CRO	156.000 CRO	159.000 CRO		
1992 OCT	144.000 CRO	150.000 CRO	154.000 CRO		
1992 DEC	148.000	153.000	151.000		

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 WALLACEBURG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM ROBERT ST FREE FLOW	DIST. SYSTEM ROBERT ST STANDING	DIST. SYSTEM THOMAS AVE FREE FLOW	DIST. SYSTEM THOMAS AVE STANDING
CHEMISTRY (LABORATORY)					
SULPHATE (MG/L)		DET'N LIMIT = 0.20		GUIDELINE = 500 (A3)	
1991 JAN	16.540	23.900	24.390	23.130	24.230
1991 MAR	16.640	27.290	27.110	31.640	28.780
1991 MAY	16.850	25.070	24.180	24.590	24.760
1991 JUL	17.170	24.640	24.240	24.240	24.700
1991 SEP	16.970	24.980	25.130	25.650	24.820
1991 NOV	17.550	25.320	23.860	24.220	24.110
1992 FEB	34.570	77.880	70.150		
1992 APR	16.390	23.540		23.350	23.330
1992 JUN	16.680	24.580	24.060		
1992 AUG	16.240	21.850	21.930		
1992 OCT	16.830	23.910	30.370		
1992 DEC	16.480	24.070	23.130		
TURBIDITY (FTU)					
		DET'N LIMIT = 0.05		GUIDELINE = 1.0 (A1)	
1991 JAN	3.100	.300	1.700 RRV	.520	.560
1991 MAR	3.800	.130	.960	.610	.710
1991 MAY	3.300	.590	.460	.420	.760
1991 JUL	7.000	.240	.470	.850	.390
1991 SEP	4.200	.330	.520	.290	.380
1991 NOV	1.980	.420	.880	.620	.720
200.000 >		.340	1.160 RRV		
1992 FEB	7.500	.310		.320	.430
1992 APR	6.200	.370	.830		
1992 JUN	5.400	.980	.720		
1992 AUG	5.100	.250	1.670 RRV		
1992 OCT	2.900	.260	3.400 RRV		
1992 DEC					

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 WALLACEBURG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM ROBERT ST FREE FLOW	DIST. SYSTEM ROBERT ST STANDING	DIST. SYSTEM THOMAS AVE FREE FLOW	DIST. SYSTEM THOMAS AVE STANDING
METALS					
SILVER (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = N/A	
1991 JAN	BDL	BDL	BDL	BDL	BDL
1991 MAR	BDL	BDL	BDL	BDL	BDL
1991 MAY	BDL	BDL	BDL	BDL	BDL
1991 JUL	BDL	.140 <T	.070 <T	BDL	.060 <T
1991 SEP	BDL	BDL	BDL	BDL	BDL
1991 NOV	BDL	BDL	BDL	BDL	BDL
1991 DEC	BDL	BDL	BDL	BDL	BDL
1992 JAN	BDL	BDL	BDL	BDL	BDL
1992 APR	BDL	BDL	BDL	BDL	BDL
1992 JUN	BDL	BDL	BDL	BDL	BDL
1992 AUG	BDL	BDL	BDL	BDL	BDL
1992 OCT	BDL	BDL	BDL	BDL	BDL
1992 DEC	BDL	BDL	BDL	BDL	BDL
ALUMINUM (UG/L)					
		DET'N LIMIT = 0.10		GUIDELINE = 100 (A4)	
1991 JAN	28.000	18.000	22.000	15.000	14.000
1991 MAR	53.000	19.000	22.000	17.000	23.000
1991 MAY	41.000	32.000	30.000	25.000	26.000
1991 JUL	72.000	79.000	89.000	58.000	54.000
1991 SEP	74.000	94.000	86.000	77.000	68.000
1991 NOV	26.000	36.000	35.000	63.000	68.000
1992 FEB	18.000	74.000	82.000	17.000	17.000
1992 APR	57.000	23.000	53.000	110.000	110.000
1992 JUN	58.000	69.000	110.000	110.000	110.000
1992 AUG	75.000	190.000	110.000	110.000	110.000
1992 OCT	53.000	70.000	61.000	65.000	65.000
1992 DEC	41.000	30.000	24.000	65.000	65.000
ARSENIC (UG/L)					
		DET'N LIMIT = 0.10		GUIDELINE = 25 (A1)	
1991 JAN	.650 <T	.480 <T	.440 <T	.530 <T	.300 <T
1991 MAR	.380 <T	BDL	BDL	.240 <T	BDL
1991 MAY	BDL	BDL	BDL	BDL	BDL
1991 JUL	.590 <T	.310 <T	.380 <T	.300 <T	.410 <T
1991 SEP	.680 <T	.390 <T	.450 <T	.370 <T	.350 <T
1991 NOV	.630 <T	.560 <T	.500 <T	.440 <T	.540 <T
1992 FEB	.980 <T	.470 <T	.480 <T	.490 <T	.410 <T
1992 APR	BDL	.130 <T	BDL	.310 <T	BDL
1992 JUN	.270 <T	BDL	BDL	BDL	BDL
1992 AUG	.630 <T	.360 <T	.400 <T	.330 <T	BDL
1992 OCT	.720 <T	.380 <T	.340 <T	.770 <T	BDL
1992 DEC	.720 <T	.310 <T	BDL	BDL	BDL



TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 WALLACEBURG WTP

TREATMENT PLANT RAW		TREATMENT PLANT TREATED	DIST. SYSTEM ROBERT ST FREE FLOW	DIST. SYSTEM ROBERT ST STANDING	DIST. SYSTEM THOMAS AVE FREE FLOW	DIST. SYSTEM THOMAS AVE STANDING
METALS						
BARIUM (UG/L)			DET'N LIMIT = 0.05		GUIDELINE = 1000 (A2)	
1991 JAN	14.000	14.000	13.000	13.000	13.000	13.000
1991 MAR	15.000	15.000	15.000	16.000	15.000	16.000
1991 MAY	15.000	16.000	15.000	16.000	16.000	16.000
1991 JUL	14.000	15.000	15.000	15.000	15.000	16.000
1991 SEP	14.000	14.000	13.000	13.000	14.000	13.000
1991 NOV	15.000	16.000	16.000	16.000	16.000	15.000
1992 FEB	47.000	28.000	27.000	27.000	-	-
1992 APR	14.000	13.000	-	-	13.000	14.000
1992 JUN	16.000	17.000	17.000	17.000	-	-
1992 AUG	15.000	17.000	17.000	16.000	-	-
1992 OCT	15.000	16.000	15.000	16.000	-	-
1992 DEC	14.000	14.000	15.000	16.000	-	-
BORON (UG/L)			DET'N LIMIT = 2.00		GUIDELINE = 5000 (A1)	
1991 JAN	15.000 <T	17.000 <T	16.000 <T	35.000	16.000 <T	16.000 <T
1991 MAR	14.000 <T	16.000 <T	18.000 <T	23.000	18.000 <T	19.000 <T
1991 MAY	12.000 <T	15.000 <T	15.000 <T	15.000 <T	16.000 <T	16.000 <T
1991 JUL	13.000 <T	18.000 <T	19.000 <T	34.000	18.000 <T	18.000 <T
1991 SEP	13.000 <T	13.000 <T	13.000 <T	13.000 <T	13.000 <T	13.000 <T
1991 NOV	12.000 <T	15.000 <T	14.000 <T	15.000 <T	15.000 <T	14.000 <T
1992 FEB	26.000	29.000	25.000	27.000	-	-
1992 APR	11.000 <T	12.000 <T	-	-	13.000 <T	13.000 <T
1992 JUN	17.000 <T	18.000 <T	19.000 <T	22.000	-	-
1992 AUG	42.000	33.000	28.000	28.000	-	-
1992 OCT	19.000 <T	23.000	20.000 <T	29.000	-	-
1992 DEC	15.000 <T	15.000 <T	16.000 <T	18.000 <T	-	-
BERYLLIUM (UG/L)			DET'N LIMIT = 0.05		GUIDELINE = 6800 (D4)	
1991 JAN	BOL	BOL	BOL	BOL	BOL	BOL
1991 MAR	BOL	BOL	BOL	BOL	BOL	BOL
1991 MAY	BOL	BOL	BOL	BOL	BOL	BOL
1991 JUL	BOL	BOL	BOL	BOL	BOL	BOL
1991 SEP	BOL	BOL	BOL	BOL	BOL	BOL
1991 NOV	BOL	BOL	BOL	BOL	BOL	BOL
1992 FEB	-210 <T	BOL	BOL	BOL	BOL	BOL
1992 APR	BOL	BOL	-	-	BOL	-
1992 JUN	BOL	BOL	BOL	BOL	-	-
1992 AUG	BOL	BOL	BOL	BOL	-	-
1992 OCT	BOL	BOL	.070 <T	.480 <T	-	-
1992 DEC	BOL	BOL	BOL	BOL	-	-

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 WALLACEBURG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM FREE FLOW	DIST. SYSTEM ROBERT ST STANDING	DIST. SYSTEM THOMAS AVE FREE FLOW	DIST. SYSTEM THOMAS AVE STANDING
<b>METALS</b>					
<b>CADMIUM (UG/L)</b>		DET'N LIMIT = 0.05		GUIDELINE = 5.0 (A1)	
1991 JAN	BDL	BDL	.210 <T	BDL	BDL
1991 MAR	BDL	BDL	.090 <T	BDL	BDL
1991 MAY	BDL	BDL	.070 <T	BDL	BDL
1991 JUL	BDL	BDL	.070 <T	BDL	BDL
1991 SEP	BDL	BDL	.080 <T	.090 <T	BDL
1991 NOV	BDL	BDL	.320 <T	BDL	BDL
1992 FEB	.090 <T	BDL			
1992 APR	BDL	BDL		BDL	BDL
1992 JUN	BDL	BDL			
1992 AUG	BDL	BDL			
1992 OCT	BDL	.070 <T	1.300		
1992 DEC	.080 <T	BDL	.250 <T		
<b>COBALT (UG/L)</b>		DET'N LIMIT = 0.02		GUIDELINE = N/A	
1991 JAN	2.000	1.900	1.900	2.000	2.000
1991 MAR	.030 <T	BDL	BDL	BDL	BDL
1991 MAY	.150 <T	.050 <T	.080 <T	.070 <T	.060 <T
1991 JUL	.190 <T	.170 <T	.110 <T	.080 <T	.140 <T
1991 SEP	.130 <T	.080 <T	.080 <T	.090 <T	.080 <T
1991 NOV	1.800	.080 <T	.090 <T	.150 <T	.090 <T
1992 FEB	.430 <T	.390 <T	.370 <T		
1992 APR	.090 <T	.060 <T		.080 <T	.040 <T
1992 JUN	.170 <T	.160 <T	.150 <T		
1992 AUG	.250 <T	.200 <T	.100 <T		
1992 OCT	.170 <T	.080 <T	.220 <T		
1992 DEC	.280 <T	.170 <T	2.700		
<b>CHROMIUM (UG/L)</b>		DET'N LIMIT = 0.50		GUIDELINE = 50.0 (A1)	
1991 JAN	3.500 <T	3.400 <T	3.000 <T	3.100 <T	2.900 <T
1991 MAR	1.600 <T	.770 <T	1.600 <T	1.000 <T	.690 <T
1991 MAY	BDL	BDL	.890 <T	.740 <T	.560 <T
1991 JUL	5.40 <T	1.600 <T	1.700 <T	1.600 <T	1.500 <T
1991 SEP	.540 <T	.540 <T	BDL	1.800 <T	.640 <T
1991 NOV	.510 <T	.550 <T	.540 <T	.640 <T	.570 <T
1992 FEB	2.800 <T	BDL	BDL		
1992 APR	BDL	BDL		BDL	BDL
1992 JUN	.880 <T	.560 <T	.700 <T		
1992 AUG	2.200 <T	1.700 <T	1.800 <T		
1992 OCT	3.600 <T	BDL	2.400 <T		
1992 DEC	1.500 <T	.770 <T	.560 <T		

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 WALLACEBURG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM ROBERT ST FREE FLOW	DIST. SYSTEM STANDING	DIST. SYSTEM THOMAS AVE FREE FLOW	DIST. SYSTEM THOMAS AVE STANDING
METALS					
COPPER (UG/L )		DET'N LIMIT = 0.50		GUIDELINE = 1000 (A3)	
1991 JAN	1.800 <T	1.900 <T	94.000	4.800 <T	14.000
1991 MAR	1.900 <T	1.600 <T	250.000	4.800 <T	45.000
1991 MAY	2.300 <T	2.700 <T	98.000	38.000	9.200
1991 JUL	2.600 <T	1.790 <T	160.000	8.200	17.000
1991 SEP	2.400 <T	1.700 <T	45.000	5.300	20.000
1991 NOV	2.300 <T	1.700 <T	49.000	4.800 <T	8.300
1992 FEB	6.200	3.100 <T	180.000		
1992 APR	1.800 <T	1.600 <T		5.100	27.000
1992 JUN	2.400 <T	2.000 <T	71.000		
1992 AUG	1.600 <T	BOL	29.000		
1992 OCT	2.200 <T	1.600 <T	81.000		
1992 DEC	3.000 <T	1.600 <T	170.000		
IRON (UG/L )		DET'N LIMIT = 6.00		GUIDELINE = 300 (A3)	
1991 JAN	37.000 <T	12.000 <T	220.000	54.000 <T	50.000 <T
1991 MAR	87.000	7.500 <T	310.000	180.000	190.000
1991 MAY	64.000	10.000 <T	100.000	62.000	51.000 <T
1991 JUL	120.000	BOL	160.000	100.000	42.000 <T
1991 SEP	140.000	10.000 <T	98.000	16.000 <T	16.000 <T
1991 NOV	45.000 <T	6.300 <T	91.000	92.000	120.000
1992 FEB	1800.000	43.000 <T	460.000		
1992 APR	100.000	BOL		50.000 <T	52.000 <T
1992 JUN	93.000	12.000 <T	170.000		
1992 AUG	89.000	7.200 <T	140.000		
1992 OCT	97.000	BOL	290.000		
1992 DEC	47.000 <T	11.000 <T	510.000		
MERCURY (UG/L )		DET'N LIMIT = 0.02		GUIDELINE = 1.0 (A1)	
24 SAMPLES					
BOL					
MANGANESE (UG/L )		DET'N LIMIT = 0.05		GUIDELINE = 50.0 (A3)	
1991 JAN	2.400	.390 <T	13.000	3.900	3.500
1991 MAR	3.900	.780	11.000	24.000	22.000
1991 MAY	3.400	.380 <T	7.400	5.900	3.600
1991 JUL	4.900	.210 <T	9.900	14.000	5.200
1991 SEP	5.400	.510	12.000	5.600	5.000
1991 NOV	2.300	.540	8.500	14.000	21.000
1992 FEB	75.000	12.000	58.000		
1992 APR	4.000	.190 <T		7.200	6.000
1992 JUN	5.200	.500 <T	13.000		
1992 AUG	4.600	.570	15.000		
1992 OCT	4.100	.100 <T	20.000		
1992 DEC	2.100	.360 <T	23.000		

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 WALLACEBURG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM ROBERT ST FREE FLOW	DIST. SYSTEM ROBERT ST STANDING	DIST. SYSTEM THOMAS AVE FREE FLOW	DIST. SYSTEM THOMAS AVE STANDING
METALS					
MOLYBDENUM (UG/L)					
		DET'N LIMIT = 0.05		GUIDELINE = N/A	
1991 JAN	.490 <T	.510	.580	.440 <T	.520
1991 MAR	.450 <T	.590	.570	.600	.680
1991 MAY	.430 <T	.540	.490 <T	.520	.620
1991 JUL	.480 <T	.540	.550	.520	.590
1991 SEP	.430 <T	.490 <T	.420 <T	.470 <T	.460 <T
1991 NOV	.490 <T	.540	.500 <T	.480 <T	.490 <T
1992 FEB	.390 <T	1.800	1.600	1.500	.480 <T
1992 APR	.430 <T	.480 <T		.580	.490 <T
1992 JUN	.200 <T	.330 <T	.200 <T		
1992 AUG	.480 <T	.680	.580		
1992 OCT	.460 <T	.540	1.100		
1992 DEC	.420 <T	.560	.500 <T		
NICKEL (UG/L)					
		DET'N LIMIT = 0.20		GUIDELINE = 350 (03)	
1991 JAN	6.900	7.600	6.400	8.800	7.000
1991 MAR	BDL	BDL	BDL	1.200 <T	.410 <T
1991 MAY	BDL	BDL	BDL	BDL	BDL
1991 JUL	.450 <T	BDL	.720 <T	1.500 <T	.590 <T
1991 SEP	1.200 <T	1.000 <T	.920 <T	1.300 <T	.690 <T
1991 NOV	BDL	BDL	BDL	2.600	2.100
1992 FEB	6.800	2.100	2.400	6.300	BDL
1992 APR	1.600 <T	1.500 <T		1.300 <T	3.000
1992 JUN	.270 <T	BDL	BDL	1.300 <T	
1992 AUG	.860 <T	.710 <T	.660 <T	.960 <T	
1992 OCT	BDL	BDL	BDL	3.800	
1992 DEC	BDL	BDL	8.200	8.600	
LEAD (UG/L)					
		DET'N LIMIT = 0.05		GUIDELINE = 10 (A1)	
1991 JAN	.320 <T	.260 <T	.270 <T	2.700	.300 <T
1991 MAR	.300 <T	.180 <T	.100 <T	4.900	5.900
1991 MAY	.570	.210 <T	.100 <T	2.300	.150 <T
1991 JUL	.480 <T	BDL	.090 <T	4.400	.370 <T
1991 SEP	.510	.190 <T	.190 <T	3.300	.420 <T
1991 NOV	.400 <T	.220 <T	.180 <T	1.700	.250 <T
1992 FEB	4.600	.390 <T	.090 <T	3.500	
1992 APR	.260 <T	BDL		.060 <T	.480 <T
1992 JUN	.440 <T	.310 <T	.120 <T	2.200	
1992 AUG	.340 <T	.130 <T	.170 <T	1.300	
1992 OCT	.910	BDL	.400 <T	4.700	
1992 DEC	.350 <T	.160 <T	.180 <T	15.000	

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 WALLACEBURG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM ROBERT ST FREE FLOW	DIST. SYSTEM ROBERT ST STANDING	DIST. SYSTEM THOMAS AVE FREE FLOW	DIST. SYSTEM THOMAS AVE STANDING	METALS	
						ANTHONY (UG/L)	SELENIUM (UG/L)
		DET'N LIMIT = 0.05		GUIDELINE = 146 (D4)			
1991 JAN	.520	.590	.640	.630	.470 <T	.620	
1991 MAR	.520	.520	.490 <T	.620	.570	.580	
1991 MAY	.500 <T	.300 <T	.440 <T	.400 <T	.470 <T	.450 <T	
1991 JUL	.470 <T	.450 <T	.630	.620	.560	.880	
1991 SEP	.380 <T	.440 <T	.510	.640	.680	.520	
1991 NOV	.610	.490 <T	.560	.650	.600	.910	
1992 FEB	.250 <T	.580	.820	.880	.650	.720	
1992 APR	.440 <T	.470 <T	.510	.550	.650	.620	
1992 JUN	.390 <T	.360 <T	.530	.350 <T	.650	.620	
1992 AUG	.340 <T	.370 <T	.580	.650	.680	.620	
1992 OCT	.530	.440 <T	.470 <T	.680	.680	.620	
1992 DEC	.860	.480 <T	.470 <T	.680	.680	.620	
		DET'N LIMIT = 1.00		GUIDELINE = 10 (A1)			
1991 JAN	1.400 <T	3.300 <T	4.500 <T	4.800 <T	4.300 <T	4.500 <T	
1991 MAR	BDL	BDL	1.100 <T	BDL	BDL	1.300 <T	
1991 MAY	BDL	BDL	BDL	BDL	BDL	BDL	
1991 JUL	BDL	BDL	BDL	BDL	BDL	BDL	
1991 SEP	BDL	BDL	BDL	BDL	BDL	BDL	
1991 NOV	BDL	BDL	BDL	BDL	BDL	BDL	
1992 FEB	1.500 <T	1.500 <T	1.300 <T	1.100 <T	BDL	BDL	
1992 APR	BDL	1.700 <T	BDL	BDL	BDL	BDL	
1992 JUN	BDL	BDL	BDL	BDL	BDL	BDL	
1992 AUG	1.600 <T	2.400 <T	1.600 <T	1.600 <T	BDL	BDL	
1992 OCT	BDL	BDL	BDL	1.800 <T	BDL	BDL	
1992 DEC	BDL	BDL	BDL	BDL	BDL	BDL	
		DET'N LIMIT = 0.10		GUIDELINE = N/A			
STRONTIUM (UG/L)		DET'N LIMIT = 0.10		GUIDELINE = N/A			
1991 JAN	96.000	99.000	96.000	94.000	96.000	96.000	
1991 MAR	100.000	100.000	110.000	110.000	110.000	110.000	
1991 MAY	100.000	100.000	100.000	100.000	110.000	100.000	
1991 JUL	98.000	99.000	96.000	99.000	97.000	100.000	
1991 SEP	94.000	96.000	94.000	94.000	100.000	93.000	
1991 NOV	100.000	100.000	100.000	110.000	110.000	110.000	
1992 FEB	150.000	140.000	120.000	140.000	110.000	110.000	
1992 APR	94.000	92.000	120.000	130.000	98.000	97.000	
1992 JUN	120.000	130.000	120.000	130.000	98.000	97.000	
1992 AUG	110.000	110.000	110.000	110.000	98.000	97.000	
1992 OCT	110.000	110.000	100.000	100.000	98.000	97.000	
1992 DEC	95.000	98.000	110.000	100.000	98.000	97.000	

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 WALLACEBURG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM ROBERT ST FREE FLOW	DIST. SYSTEM ROBERT ST STANDING	DIST. SYSTEM THOMAS AVE FREE FLOW	DIST. SYSTEM THOMAS AVE STANDING
METALS					
TITANIUM (UG/L)		DET'N LIMIT = 0.50		GUIDELINE = N/A	
1991 JAN	6.900	8.000	7.600	8.100	7.600
1991 MAR	4.500 <T	4.500 <T	4.500 <T	5.000 <T	4.800 <T
1991 MAY	2.600 <T	2.000 <T	2.300 <T	2.000 <T	1.800 <T
1991 JUL	2.500 <T	1.200 <T	1.000 <T	1.800 <T	.890 <T
1991 SEP	2.900 <T	1.700 <T	1.400 <T	1.700 <T	1.200 <T
1991 NOV	1.800 <T	2.100 <T	2.000 <T	2.100 <T	1.500 <T
1992 FEB	10.000	4.900 <T	4.200 <T	4.100 <T	1.900 <T
1992 APR	4.400 <T	3.900 <T	1.400 <T	1.700 <T	3.300 <T
1992 JUN	2.800 <T	1.600 <T	1.400 <T	4.400 <T	-
1992 AUG	5.800	4.800 <T	4.900 <T	4.400 <T	-
1992 OCT	2.400 <T	1.100 <T	1.500 <T	-	-
1992 DEC	3.300 <T	3.100 <T	11.000	10.000	-
THALLIUM (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = 13 (D4)	
1991 JAN	BDL	BDL	BDL	BDL	BDL
1991 MAR	BDL	BDL	BDL	BDL	BDL
1991 MAY	BDL	BDL	BDL	BDL	BDL
1991 JUL	BDL	BDL	BDL	BDL	BDL
1991 SEP	BDL	BDL	BDL	BDL	BDL
1991 NOV	BDL	BDL	BDL	BDL	BDL
1992 FEB	BDL	BDL	BDL	BDL	BDL
1992 APR	BDL	BDL	BDL	BDL	BDL
1992 JUN	BDL	BDL	BDL	BDL	BDL
1992 AUG	BDL	BDL	BDL	BDL	BDL
1992 OCT	BDL	BDL	BDL	BDL	BDL
1992 DEC	BDL	BDL	BDL	BDL	BDL
URANIUM (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = 100 (A1)	
1991 JAN	.240 <T	.060 <T	BDL	BDL	.070 <T
1991 MAR	.240 <T	.110 <T	.130 <T	.110 <T	.100 <T
1991 MAY	.240 <T	.100 <T	.070 <T	.070 <T	.090 <T
1991 JUL	.250 <T	.200 <T	.120 <T	.100 <T	.110 <T
1991 SEP	.200 <T	.070 <T	.080 <T	BDL	BDL
1991 NOV	.190 <T	.070 <T	.060 <T	.090 <T	.070 <T
1992 FEB	1.300	.070 <T	BDL	.090 <T	.060 <T
1992 APR	.210 <T	.080 <T	.090 <T	.070 <T	-
1992 JUN	.250 <T	.100 <T	.120 <T	.140 <T	-
1992 AUG	.240 <T	.150 <T	.130 <T	.290 <T	-
1992 OCT	.230 <T	.110 <T	.080 <T	.100 <T	-
1992 DEC	.210 <T	.120 <T	.080 <T	.100 <T	-

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 WALLACEBURG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM ROBERT ST FREE FLOW	DIST. SYSTEM ROBERT ST STANDING	DIST. SYSTEM THOMAS AVE FREE FLOW	DIST. SYSTEM THOMAS AVE STANDING
METALS					
VANADIUM (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = N/A	
1991 JAN	.120 <T	.320 <T	.450 <T	.540	.290 <T
1991 MAR	.280 <T	.520	.370 <T	.450 <T	.390 <T
1991 MAY	BDL	.080 <T	BDL	BDL	.210 <T
1991 JUL	.110 <T	.420 <T	.320 <T	.460 <T	.190 <T
1991 SEP	.290 <T	.610	.480 <T	.490 <T	.360 <T
1991 NOV	.080 <T	.240 <T	.200 <T	.210 <T	.370 <T
1992 FEB	3.200	.500 <T	.490 <T	.590	BDL
1992 APR	.130 <T	.180 <T	BDL	BDL	BDL
1992 JUN	BDL	BDL	BDL	BDL	BDL
1992 AUG	.370 <T	.630	.510	.520	BDL
1992 OCT	.300 <T	.580	.530	1.800	BDL
1992 DEC	.160 <T	.290 <T	.560	1.100	BDL
ZINC (UG/L)		DET'N LIMIT = 0.20		GUIDELINE = 5000 (A3)	
1991 JAN	2.800	3.700	3.300	58.000	7.000
1991 MAR	3.100	3.900	3.100	86.000	20.000
1991 MAY	3.700	3.800	2.900	36.000	2.500
1991 JUL	3.800	2.300	3.100	27.000	5.800
1991 SEP	3.000	2.800	2.200	33.000	6.800
1991 NOV	2.700	2.600	1.800 <T	18.000	2.600
1992 FEB	19.000	6.800	4.600	95.000	15.000
1992 APR	2.700	1.500 <T	1.700 <T	2.400	BDL
1992 JUN	2.100	2.900	1.600 <T	BDL	BDL
1992 AUG	3.200	2.100	4.800	85.000	BDL
1992 OCT	4.100	2.100	5.700	64.000	BDL
1992 DEC	5.300	4.600	BDL	BDL	BDL

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 WALLACEBURG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM ROBERT ST FREE FLOW	DIST. SYSTEM ROBERT ST STANDING	DIST. SYSTEM THOMAS AVE FREE FLOW	DIST. SYSTEM THOMAS AVE STANDING
CHLORODROMATICS					
HEXACHLOROBUTADIENE (NG/L)		DET'N LIMIT = 1.000		GUIDELINE = 450 (04)	
1991 JAN	BDL				
1991 MAR	3,000 <T	1LA		BDL	
1991 MAY	2,000 <T	BDL		BDL	
1991 JUL	1AW	1AW		1AW	
1991 SEP	1AW	1AW		1AW	
1991 NOV	BDL	BDL		BDL	
1992 FEB	BDL	BDL			
1992 APR	BDL			BDL	
1992 JUN	BDL	BDL			
1992 AUG	BDL	BDL			
1992 OCT	BDL	BDL			
1992 DEC	BDL	BDL			
123-TRICHLOROBENZENE (NG/L)		DET'N LIMIT = 5.000		GUIDELINE = N/A	
33 SAMPLES	BDL	BDL		BDL	
1234-TETCHLOROBENZENE (NG/L)		DET'N LIMIT = 1.000		GUIDELINE = N/A	
33 SAMPLES	BDL	BDL		BDL	
1235-TETCHLOROBENZENE (NG/L)		DET'N LIMIT = 1.000		GUIDELINE = N/A	
33 SAMPLES	BDL	BDL		BDL	
124-TRICHLOROBENZENE (NG/L)		DET'N LIMIT = 5.000		GUIDELINE = 10000 (1)	
33 SAMPLES	BDL	BDL		BDL	
1245-TETCHLOROBENZENE (NG/L)		DET'N LIMIT = 1.000		GUIDELINE = 38000 (04)	
33 SAMPLES	BDL	BDL		BDL	
135-TRICHLOROBENZENE (NG/L)		DET'N LIMIT = 5.000		GUIDELINE = N/A	
33 SAMPLES	BDL	BDL		BDL	



TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 WALLACEBURG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM FREE FLOW	DIST. SYSTEM ROBERT ST STANDING	DIST. SYSTEM THOMAS ST FREE FLOW	DIST. SYSTEM THOMAS AVE STANDING
CHLOROAROMATICS					
HEXACHLOROBENZENE (NG/L)		DET'N LIMIT = 1,000		GUIDELINE = 10 (C1)	
1991 JAN	BDL	BDL	ILA	BDL	-
1991 MAR	BDL	BDL	BDL	BDL	-
1991 MAY	BDL	BDL	BDL	BDL	-
1991 JUL	IAW	IAW	IAW	IAW	-
1991 SEP	IAW	IAW	IAW	IAW	-
1991 NOV	BDL	BDL	BDL	BDL	-
1992 FEB	2,000 <T	BDL	BDL	BDL	-
1992 APR	BDL	BDL	BDL	BDL	-
1992 JUN	BDL	BDL	BDL	BDL	-
1992 AUG	BDL	BDL	BDL	BDL	-
1992 OCT	BDL	BDL	BDL	BDL	-
1992 DEC	BDL	BDL	BDL	BDL	-
HEXACHLOROETHANE (NG/L)		DET'N LIMIT = 1,000		GUIDELINE = 1900 (D4)	
1991 JAN	BDL	BDL	ILA	BDL	-
1991 MAR	BDL	BDL	BDL	BDL	-
1991 MAY	BDL	2,000 <T	BDL	BDL	-
1991 JUL	IAW	IAW	IAW	IAW	-
1991 SEP	IAW	IAW	IAW	IAW	-
1991 NOV	BDL	4,000 <T	4,000 <T	4,000 <T	-
1992 FEB	BDL	BDL	BDL	BDL	-
1992 APR	BDL	BDL	BDL	BDL	-
1992 JUN	BDL	1,000 <T	BDL	BDL	-
1992 AUG	BDL	BDL	BDL	BDL	-
1992 OCT	BDL	2,000 <T	BDL	BDL	-
1992 DEC	BDL	BDL	BDL	BDL	-
OCTACHLOROSTYRENE (NG/L)		DET'N LIMIT = 1,000		GUIDELINE = N/A	
33 SAMPLES	BDL	BDL	BDL	BDL	-
PENTACHLOROBENZENE (NG/L)		DET'N LIMIT = 1,000		GUIDELINE = 74000 (D4)	
33 SAMPLES	BDL	BDL	BDL	BDL	-
236-TRICHLOROTOLUENE (NG/L)		DET'N LIMIT = 5,000		GUIDELINE = N/A	
33 SAMPLES	BDL	BDL	BDL	BDL	-
245-TRICHLOROTOLUENE (NG/L)		DET'N LIMIT = 5,000		GUIDELINE = N/A	
33 SAMPLES	BDL	BDL	BDL	BDL	-

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 WALLACEBURG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM ROBERT ST FREE FLOW	DIST. SYSTEM ROBERT ST STANDING	DIST. SYSTEM THOMAS AVE FREE FLOW	DIST. SYSTEM THOMAS AVE STANDING
CHLORODAROMATICS					
26A-TRICHLOROTOLUENE (NG/L)		DET'N LIMIT = 5.000		GUIDELINE = N/A	
33 SAMPLES	BDL	BDL	BDL	BDL	BDL

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 WALLACEBURG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM ROBERT ST FREE FLOW	DIST. SYSTEM ROBERT ST STANDING	DIST. SYSTEM THOMAS AVE FREE FLOW	DIST. SYSTEM THOMAS AVE STANDING
CHLOROPHENOLS					
234-TRICHLOROPHENOL (NG/L )		DET'N LIMIT = 100.0		GUIDELINE = N/A	
8 SAMPLES	BDL				
2345-TETCHLOROPHENOL (NG/L )		DET'N LIMIT = 20.0		GUIDELINE = N/A	
8 SAMPLES	BDL				
2356-TETCHLOROPHENOL (NG/L )		DET'N LIMIT = 10.0		GUIDELINE = N/A	
8 SAMPLES	BDL				
245-TRICHLOROPHENOL (NG/L )		DET'N LIMIT = 100.0		GUIDELINE = 2600000 (D4)	
8 SAMPLES	BDL				
246-TRICHLOROPHENOL (NG/L )		DET'N LIMIT = 20.0		GUIDELINE = 5000 (A1)	
8 SAMPLES	BDL				
PENTACHLOROPHENOL (NG/L )		DET'N LIMIT = 10.00		GUIDELINE = 60000 (A1)	
8 SAMPLES	BDL				

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 WALLACEBURG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM ROBERT ST FREE FLOW	DIST. SYSTEM ROBERT ST STANDING	DIST. SYSTEM THOMAS AVE FREE FLOW	DIST. SYSTEM THOMAS AVE STANDING
PESTICIDES AND PCB					
ALDRIN (NG/L )		DET'N LIMIT = 1.000		GUIDELINE = 700 (A1)	
33 SAMPLES	BDL	BDL		BDL	
ALPHA BHC (NG/L )		DET'N LIMIT = 1.000		GUIDELINE = 700 (G)	
1991 JAN	2.000 <T	1.000 <T		1.000 <T	
1991 MAR	BDL	BDL		BDL	
1991 MAY	2.000 <T	BDL		BDL	
1991 JUL	1AW	1AW		1AW	
1991 SEP	1AW	1AW		1AW	
1991 NOV	BDL	BDL		BDL	
1992 FEB	BDL	BDL		BDL	
1992 APR	1.000 <T	BDL		BDL	
1992 JUN	BDL	BDL		BDL	
1992 AUG	BDL	BDL		BDL	
1992 OCT	BDL	BDL		BDL	
1992 DEC	1.000 <T	BDL		BDL	
BETA BHC (NG/L )		DET'N LIMIT = 1.00		GUIDELINE = 300 (G)	
33 SAMPLES	BDL	BDL		BDL	
LINDANE (GAMMA BHC) (NG/L )		DET'N LIMIT = 1.000		GUIDELINE = 4000 (A1)	
33 SAMPLES	BDL	BDL		BDL	
ALPHA CHLORDANE (NG/L )		DET'N LIMIT = 2.000		GUIDELINE = 7000 (A1)	
33 SAMPLES	BDL	BDL		BDL	
GAMMA CHLORDANE (NG/L )		DET'N LIMIT = 2.00		GUIDELINE = 7000 (A1)	
33 SAMPLES	BDL	BDL		BDL	
DIELDRIN (NG/L )		DET'N LIMIT = 2.00		GUIDELINE = 700 (A1)	
33 SAMPLES	BDL	BDL		BDL	
METHOXYCHLOR (NG/L )		DET'N LIMIT = 5.0		GUIDELINE = 900000 (A1)	
33 SAMPLES	BDL	BDL		BDL	
ENDOSULFAN 1 (NG/L )		DET'N LIMIT = 2.00		GUIDELINE = 74000 (D4)	
33 SAMPLES	BDL	BDL		BDL	

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 WALLACEBURG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM ROBERT ST FREE FLOW	DIST. SYSTEM ROBERT ST STANDING	DIST. SYSTEM THOMAS AVE FREE FLOW	DIST. SYSTEM THOMAS AVE STANDING
PESTICIDES AND PCB					
ENDOSULFAN II (NG/L )					
33 SAMPLES	BDL	BDL	DET*N LIMIT = 5.000	GUIDELINE = 74000 (D4)	BDL
ENDRIN (NG/L )					
33 SAMPLES	BDL	BDL	DET*N LIMIT = 5.000	GUIDELINE = 1600 (D3)	BDL
ENDOSULFAN SULPHATE (NG/L )					
33 SAMPLES	BDL	BDL	DET*N LIMIT = 5.00	GUIDELINE = N/A	BDL
HEPTACHLOR EPOXIDE (NG/L )					
27 SAMPLES	BDL	BDL	DET*N LIMIT = 1.000	GUIDELINE = 3000 (A1)	BDL
HEPTACHLOR (NG/L )					
33 SAMPLES	BDL	BDL	DET*N LIMIT = 1.000	GUIDELINE = 3000 (A1)	BDL
MIREX (NG/L )					
33 SAMPLES	BDL	BDL	DET*N LIMIT = 5.000	GUIDELINE = N/A	BDL
OXYCHLORDANE (NG/L )					
33 SAMPLES	BDL	BDL	DET*N LIMIT = 2.000	GUIDELINE = N/A	BDL
O,P-DDT (NG/L )					
33 SAMPLES	BDL	BDL	DET*N LIMIT = 5.000	GUIDELINE = 30000 (A1)	BDL
PCB (NG/L )					
27 SAMPLES	BDL	BDL	DET*N LIMIT = 20.00	GUIDELINE = 3000 (A2)	BDL
P,P-DDD (NG/L )					
33 SAMPLES	BDL	BDL	DET*N LIMIT = 5.000	GUIDELINE = 30000 (A1)	BDL
P,P-DDE (NG/L )					
33 SAMPLES	BDL	BDL	DET*N LIMIT = 1.000	GUIDELINE = 30000 (A1)	BDL
P,P-DDT (NG/L )					
33 SAMPLES	BDL	BDL	DET*N LIMIT = 5.000	GUIDELINE = 30000 (A1)	BDL

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 WALLACEBURG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM FREE FLOW	DIST. SYSTEM STANDING	DIST. SYSTEM THOMAS AVE FREE FLOW	DIST. SYSTEM THOMAS AVE STANDING
PESTICIDES AND PCB					
TOXAPHENE (NG/L)		DET'N LIMIT = 500.0		GUIDELINE = 5000 (A1)	
26 SAMPLES	BOL	BOL	BOL	BOL	BOL
AMETRINE (NG/L)		DET'N LIMIT = 50.0		GUIDELINE = 300000 (D3)	
23 SAMPLES	BOL	BOL	BOL	BOL	BOL
ATRAZINE (NG/L)		DET'N LIMIT = 50.0		GUIDELINE = 60000 (A2)	
1991 JAN	BOL	BOL	BOL	BOL	BOL
1991 MAR	110.000 <T	BOL	BOL	BOL	BOL
1991 MAY	BOL	BOL	BOL	BOL	BOL
1991 JUL	BOL	BOL	BOL	BOL	BOL
1991 SEP	1AW	BOL	BOL	BOL	BOL
1991 NOV	BOL	BOL	BOL	BOL	BOL
1992 FEB	300.000 <T	240.000 <T	BOL	BOL	BOL
1992 APR	BOL	BOL	BOL	BOL	BOL
1992 JUN	50.000 <T	BOL	BOL	BOL	BOL
1992 AUG	BOL	BOL	BOL	BOL	BOL
1992 OCT	BOL	BOL	BOL	BOL	BOL
1992 DEC	50.000 <T	BOL	BOL	BOL	BOL
ATRATONE (NG/L)		DET'N LIMIT = 50.0		GUIDELINE = N/A	
21 SAMPLES	BOL	BOL	BOL	BOL	BOL
CYANAZINE (BLADEX) (NG/L)		DET'N LIMIT = 100.0		GUIDELINE = 10000 (A2)	
23 SAMPLES	BOL	BOL	BOL	BOL	BOL
DESETHYL ATRAZINE (NG/L)		DET'N LIMIT = 200.0		GUIDELINE = 60000 (A2)	
23 SAMPLES	BOL	BOL	BOL	BOL	BOL
DESETHYL SIMAZINE (NG/L)		DET'N LIMIT = 200.0		GUIDELINE = 10000 (A2)	
23 SAMPLES	BOL	BOL	BOL	BOL	BOL
PROMETONE (NG/L)		DET'N LIMIT = 50.000		GUIDELINE = 52500 (D3)	
23 SAMPLES	BOL	BOL	BOL	BOL	BOL
PROPAGINE (NG/L)		DET'N LIMIT = 50.000		GUIDELINE = 700000 (D3)	
23 SAMPLES	BOL	BOL	BOL	BOL	BOL

TABLE 4

## DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 WALLACEBURG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM ROBERT ST FREE FLOW	DIST. SYSTEM ROBERT ST STANDING	DIST. SYSTEM THOMAS AVE FREE FLOW	DIST. SYSTEM THOMAS AVE STANDING
PESTICIDES AND PCB					
PROMETRYNE (NG/L )		DET'N LIMIT = 50.000		GUIDELINE = 1000 (A2)	
23 SAMPLES	BDL				
METRIBUZIN (SENCOR) (NG/L )		DET'N LIMIT = 100.0		GUIDELINE = 80000 (A1)	
23 SAMPLES	BDL				
SIMAZINE (NG/L )		DET'N LIMIT = 50.00		GUIDELINE = 10000 (A2)	
1991 JAN	BDL				
1991 MAR	BDL				
1991 MAY	BDL				
1991 JUL	BDL				
1991 SEP	BDL				
1991 NOV	BDL				
1992 FEB	BDL				
1992 APR	BDL				
1992 JUN	BDL				
1992 AUG	BDL				
1992 OCT	BDL				
1992 DEC	BDL				
ALACHLOR (LASSO) (NG/L )		DET'N LIMIT = 500.0		GUIDELINE = 5000 (A2)	
23 SAMPLES	BDL				
METOLACHLOR (NG/L )		DET'N LIMIT = 500.0		GUIDELINE = 50000 (A2)	
23 SAMPLES	BDL				
HEXACHLOROCYCLOPENTADIEN (NG/L )		DET'N LIMIT = 5.00		GUIDELINE = 206000 (D4)	
18 SAMPLES	BDL	BDL		BDL	

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 WALLACEBURG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM ROBERT ST FREE FLOW	DIST. SYSTEM ROBERT ST STANDING	DIST. SYSTEM THOMAS AVE FREE FLOW	DIST. SYSTEM THOMAS AVE STANDING
PHENOLICS					
PHENOLICS (UG/L)		DET'N LIMIT =	0.2	GUIDELINE =	N/A
1991 JAN	.600 <T	BDL	-	-	-
1991 MAR	BDL	BDL	-	-	-
1991 MAY	1.200	1.000, <T	-	-	-
1991 JUL	1.000	BDL	-	-	-
1991 SEP	BDL	.800 <T	-	-	-
1991 NOV	BDL	BDL	-	-	-
1992 FEB	.400 <T	BDL	-	-	-
1992 APR	BDL	BDL	-	-	-
1992 JUN	BDL	BDL	-	-	-
1992 AUG	BDL	BDL	-	-	-
1992 OCT	BDL	-	-	-	-
1992 DEC	.400 <T	.600 <T	-	-	-



TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 WALLACEBURG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM ROBERT ST FREE FLOW	DIST. SYSTEM ROBERT ST STANDING	DIST. SYSTEM THOMAS AVE FREE FLOW	DIST. SYSTEM THOMAS AVE STANDING
POLYAROMATIC HYDROCARBONS					
PHENANTHRENE (NG/L )		DET'N LIMIT = 10.0		GUIDELINE = N/A	
12 SAMPLES	BDL	BDL			BDL
ANTHRACENE (NG/L )		DET'N LIMIT = 1.0		GUIDELINE = N/A	
12 SAMPLES	BDL	BDL			BDL
FLUORANTHENE (NG/L )		DET'N LIMIT = 20.0		GUIDELINE = 42000 (D4)	
12 SAMPLES	BDL	BDL			BDL
PYRENE (NG/L )		DET'N LIMIT = 20.0		GUIDELINE = N/A	
12 SAMPLES	BDL	BDL			BDL
BENZO(A)ANTHRACENE (NG/L )		DET'N LIMIT = 20.0		GUIDELINE = N/A	
12 SAMPLES	BDL	BDL			BDL
CHRYSENE (NG/L )		DET'N LIMIT = 50.0		GUIDELINE = N/A	
12 SAMPLES	BDL	BDL			BDL
DIMETH. BENZ(A)ANTHR (NG/L )		DET'N LIMIT = 5.0		GUIDELINE = N/A	
12 SAMPLES	BDL	BDL			BDL
BENZO(E) PYRENE (NG/L )		DET'N LIMIT = 50.0		GUIDELINE = N/A	
12 SAMPLES	BDL	BDL			BDL
BENZO(B) FLUORANTHENE (NG/L )		DET'N LIMIT = 10.0		GUIDELINE = N/A	
12 SAMPLES	BDL	BDL			BDL
PERYLENE (NG/L )		DET'N LIMIT = 10.0		GUIDELINE = N/A	
12 SAMPLES	BDL	BDL			BDL
BENZO(K) FLUORANTHENE (NG/L )		DET'N LIMIT = 1.0		GUIDELINE = N/A	
12 SAMPLES	BDL	BDL			BDL
BENZO(A) PYRENE (NG/L )		DET'N LIMIT = 5.0		GUIDELINE = 10 (A1)	
12 SAMPLES	BDL	BDL			BDL

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 WALLACEBURG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM ROBERT ST FREE FLOW	DIST. SYSTEM ROBERT ST STANDING	DIST. SYSTEM THOMAS AVE FREE FLOW	DIST. SYSTEM THOMAS AVE STANDING
POLYAROMATIC HYDROCARBONS					
BENZO(G,H,I) PERYLEN (NG/L)		DET'N LIMIT = 20.0		GUIDELINE = N/A	
12 SAMPLES	BDL	BDL		BDL	
DIBENZO(A,H) ANTHRAC (NG/L)		DET'N LIMIT = 10.0		GUIDELINE = N/A	
12 SAMPLES	BDL	BDL		BDL	
INDENO(1,2,3-C,D) PY (NG/L)		DET'N LIMIT = 20.0		GUIDELINE = N/A	
12 SAMPLES	BDL	BDL		BDL	
BENZO(B) CHRYSENE (NG/L)		DET'N LIMIT = 2.0		GUIDELINE = N/A	
12 SAMPLES	BDL	BDL		BDL	
CORONENE (NG/L)		DET'N LIMIT = 10.0		GUIDELINE = N/A	
12 SAMPLES	BDL	BDL		BDL	

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 WALLACEBURG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM ROBERT ST FREE FLOW	DIST. SYSTEM ROBERT ST STANDING	DIST. SYSTEM THOMAS AVE FREE FLOW	DIST. SYSTEM THOMAS AVE STANDING
SPECIFIC PESTICIDES					
TOXAPHENE (NG/L )		DET'N LIMIT = 500.0		GUIDELINE = 5000 (A1)	
7 SAMPLES	BDL	BDL	.	BDL	.
2,4,5-T (NG/L )		DET'N LIMIT = 50.0		GUIDELINE = 280000 (A1)	
8 SAMPLES	BDL	.	.	.	.
2,4-D (NG/L )		DET'N LIMIT = 100.0		GUIDELINE = 100000 (A1)	
8 SAMPLES	BDL	.	.	.	.
2,4-DB (NG/L )		DET'N LIMIT = 200.0		GUIDELINE = N/A	
8 SAMPLES	BDL	.	.	.	.
2,4 D PROPIONIC ACID (NG/L )		DET'N LIMIT = 100.0		GUIDELINE = N/A	
8 SAMPLES	BDL	.	.	.	.
DICAMBA (NG/L )		DET'N LIMIT = 50.0		GUIDELINE = 120000 (A1)	
8 SAMPLES	BDL	.	.	.	.
2,4,5-TP (SILVEX) (NG/L )		DET'N LIMIT = 20.00		GUIDELINE = 10000 (A1)	
8 SAMPLES	BDL	.	.	.	.
DIAZINON (NG/L )		DET'N LIMIT = 20.0		GUIDELINE = 20000 (A1)	
6 SAMPLES	BDL	.	.	.	.
DICHLORODOS (NG/L )		DET'N LIMIT = 20.0		GUIDELINE = N/A	
6 SAMPLES	BDL	.	.	.	.
CHLORPYRIFOS (NG/L )		DET'N LIMIT = 20.0		GUIDELINE = N/A	
6 SAMPLES	BDL	.	.	.	.
ETHION (NG/L )		DET'N LIMIT = 20.0		GUIDELINE = 35000 (G)	
6 SAMPLES	BDL	.	.	.	.
MALATHION (NG/L )		DET'N LIMIT = 20.0		GUIDELINE = 190000 (A1)	
6 SAMPLES	BDL	.	.	.	.

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 WALLACEBURG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM ROBERT ST FREE FLOW	DIST. SYSTEM ROBERT ST STANDING	DIST. SYSTEM THOMAS AVE FREE FLOW	DIST. SYSTEM THOMAS AVE STANDING
SPECIFIC PESTICIDES					
MEVINPHOS (NG/L )		DET'N LIMIT = 20.0		GUIDELINE = N/A	
6 SAMPLES	BDL				
METHYL PARATHION (NG/L )	BDL	DET'N LIMIT = 50.0		GUIDELINE = 9000 (D3)	
6 SAMPLES	BDL				
METHYLTRITHION (NG/L )		DET'N LIMIT = 20.0		GUIDELINE = N/A	
6 SAMPLES	BDL				
PARATHION (NG/L )		DET'N LIMIT = 20.0		GUIDELINE = 50000 (A1)	
6 SAMPLES	BDL				
PHOSPHATE (NG/L )		DET'N LIMIT = 20.0		GUIDELINE = 2000 (A2)	
6 SAMPLES	BDL				
RELDAN (NG/L )		DET'N LIMIT = 20.0		GUIDELINE = N/A	
6 SAMPLES	BDL				
RONNEL (NG/L )		DET'N LIMIT = 20.0		GUIDELINE = N/A	
6 SAMPLES	BDL				
CARBOFURAN (NG/L )		DET'N LIMIT = 2000.0		GUIDELINE = 90000 (A1)	
8 SAMPLES	BDL				
CHLOROPHOS (CI)PC (NG/L )		DET'N LIMIT = 2000.0		GUIDELINE = 350000 (G)	
8 SAMPLES	BDL				
DIALLATE (NG/L )		DET'N LIMIT = 2000.0		GUIDELINE = N/A	
8 SAMPLES	BDL				
EPTAM (NG/L )		DET'N LIMIT = 2000.0		GUIDELINE = N/A	
8 SAMPLES	BDL				
IPC (NG/L )		DET'N LIMIT = 2000.0		GUIDELINE = N/A	
8 SAMPLES	BDL				

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 WALLACEBURG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM ROBERT ST FREE FLOW	DIST. SYSTEM ROBERT ST STANDING	DIST. SYSTEM THOMAS AVE FREE FLOW	DIST. SYSTEM THOMAS AVE STANDING
SPECIFIC PESTICIDES					
PROPOXUR (NG/L )		DET'N LIMIT = 2000.0		GUIDELINE = 140000 (D3)	
8 SAMPLES	BDL				
CARBARYL (NG/L )		DET'N LIMIT = 200.0		GUIDELINE = 90000 (A1)	
8 SAMPLES	BDL				
BUTYLATE (NG/L )		DET'N LIMIT = 2000.0		GUIDELINE = 245000 (D3)	
8 SAMPLES	BDL				

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 WALLACEBURG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM ROBERT ST FREE FLOW	DIST. SYSTEM ROBERT ST STANDING	DIST. SYSTEM THOMAS AVE FREE FLOW	DIST. SYSTEM THOMAS AVE STANDING
VOLATILES					
BENZENE (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = 5 (A1)	
1991 JAN	.100 <T	BDL	BDL	BDL	BDL
1991 MAR	.050 <T	BDL	BDL	BDL	BDL
1991 MAY	BDL	BDL	BDL	BDL	BDL
1991 JUL	BDL	BDL	BDL	BDL	BDL
1991 SEP	BDL	.100 <T	BDL	.050 <T	BDL
1991 NOV	.050 <T	BDL	BDL	BDL	BDL
1992 FEB	BDL	BDL	BDL	BDL	BDL
1992 APR	BDL	BDL	BDL	BDL	BDL
1992 JUN	.050 <T	BDL	BDL	BDL	BDL
1992 AUG	BDL	BDL	BDL	BDL	BDL
1992 OCT	BDL	BDL	BDL	BDL	BDL
1992 DEC	BDL	BDL	BDL	BDL	BDL
TOLUENE (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = 24 (A3)	
1991 JAN	.100 <T	BDL	.050 <T	BDL	BDL
1991 MAR	.050 <T	BDL	BDL	BDL	BDL
1991 MAY	BDL	BDL	BDL	BDL	BDL
1991 JUL	BDL	.050 <T	BDL	BDL	BDL
1991 SEP	BDL	.250 <T	.100 <T	.150 <T	BDL
1991 NOV	.100 <T	BDL	.050 <T	.100 <T	BDL
1992 FEB	BDL	BDL	BDL	BDL	BDL
1992 APR	BDL	BDL	BDL	BDL	BDL
1992 JUN	.100 <T	BDL	BDL	BDL	BDL
1992 AUG	.100 <T	BDL	.050 <T	BDL	BDL
1992 OCT	BDL	BDL	BDL	BDL	BDL
1992 DEC	BDL	BDL	BDL	BDL	BDL
ETHYLBENZENE (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = 2.4 (A3)	
1991 JAN	.050 <T	BDL	BDL	BDL	BDL
1991 MAR	BDL	BDL	BDL	BDL	BDL
1991 MAY	BDL	.050 <T	.100 <T	.050 <T	BDL
1991 JUL	BDL	.100 <T	.100 <T	.050 <T	BDL
1991 SEP	.150 <T	.200 <T	BDL	.050 <T	BDL
1991 NOV	BDL	.100 <T	.100 <T	.100 <T	BDL
1992 FEB	BDL	.050 <T	.100 <T	.050 <T	BDL
1992 APR	BDL	.050 <T	BDL	.050 <T	BDL
1992 JUN	.100 <T	.100 <T	BDL	.050 <T	BDL
1992 AUG	.050 <T	.050 <T	.050 <T	.050 <T	BDL
1992 OCT	BDL	BDL	BDL	.050 <T	BDL
1992 DEC	.100 <T	.100 <T	.150 <T	.050 <T	BDL

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 WALLACEBURG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM ROBERT ST FREE FLOW	DIST. SYSTEM ROBERT ST STANDING	DIST. SYSTEM THOMAS AVE FREE FLOW	DIST. SYSTEM THOMAS AVE STANDING
VOLATILES					
P-XYLENE (UG/L )		DET'N LIMIT = 0.10		GUIDELINE = 300 (A3*)	
1991 JAN	BDL	BDL		BDL	
1991 MAR	BDL	BDL		BDL	
1991 MAY	BDL	BDL		BDL	
1991 JUL	BDL	BDL		BDL	
1991 SEP	BDL	BDL		BDL	
1991 NOV	BDL	BDL		BDL	
1992 FEB	BDL	BDL		BDL	
1992 APR	BDL	BDL		BDL	
1992 JUN	BDL	BDL		BDL	
1992 AUG	BDL	BDL		BDL	
1992 OCT	BDL	BDL		BDL	
1992 DEC	BDL	BDL		BDL	
M-XYLENE (UG/L )		DET'N LIMIT = 0.10		GUIDELINE = 300 (A3*)	
41 SAMPLES	BDL	BDL		BDL	
O-XYLENE (UG/L )		DET'N LIMIT = 0.05		GUIDELINE = 300 (A3*)	
1991 JAN	BDL	BDL		BDL	
1991 MAR	BDL	BDL		BDL	
1991 MAY	BDL	BDL		BDL	
1991 JUL	BDL	BDL		BDL	
1991 SEP	BDL	BDL		BDL	
1991 NOV	BDL	BDL		BDL	
1992 FEB	BDL	BDL		BDL	
1992 APR	BDL	BDL		BDL	
1992 JUN	BDL	BDL		BDL	
1992 AUG	BDL	BDL		BDL	
1992 OCT	BDL	BDL		BDL	
1992 DEC	BDL	BDL		BDL	
STYRENE (UG/L )		DET'N LIMIT = 0.05		GUIDELINE = 100 (D1)	
1991 JAN	.050 <T	BDL		BDL	
1991 MAR	BDL	.050 <T		.050 <T	
1991 MAY	BDL	.150 <T		BDL	
1991 JUL	BDL	BDL		BDL	
1991 SEP	BDL	BDL		BDL	
1991 NOV	.250 <T	BDL		.050 <T	
1992 FEB	BDL	.250 <T		.200 <T	
1992 APR	BDL	BDL		BDL	
1992 JUN	.050 <T	BDL		BDL	
1992 AUG	.050 <T	BDL		BDL	
1992 OCT	BDL	BDL		BDL	
1992 DEC	.200 <T	BDL		BDL	

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 WALLACEBURG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM ROBERT ST FREE FLOW	DIST. SYSTEM ROBERT ST STANDING	DIST. SYSTEM THOMAS AVE FREE FLOW	DIST. SYSTEM THOMAS AVE STANDING
VOLATILES					
1,1-DICHLOROETHYLENE (UG/L)		DET'N LIMIT = 0.100		GUIDELINE = 7 (D1)	
41 SAMPLES	BDL	BDL	BDL	BDL	BDL
METHYLENE CHLORIDE (UG/L)		DET'N LIMIT = 0.50		GUIDELINE = 50 (A1)	
41 SAMPLES	BDL	BDL	BDL	BDL	BDL
1,1,2-DICHLOROETHYLENE (UG/L)		DET'N LIMIT = 0.10		GUIDELINE = 70 (D1)	
41 SAMPLES	BDL	BDL	BDL	BDL	BDL
1,1-DICHLOROETHANE (UG/L)		DET'N LIMIT = 0.100		GUIDELINE = N/A	
1991 JAN	BDL	BDL	BDL	BDL	BDL
1991 MAR	BDL	BDL	BDL	BDL	BDL
1991 MAY	BDL	BDL	BDL	BDL	BDL
1991 JUL	BDL	BDL	BDL	BDL	BDL
1991 SEP	BDL	BDL	BDL	BDL	BDL
1991 NOV	BDL	BDL	BDL	BDL	BDL
1992 FEB	BDL	BDL	BDL	BDL	BDL
1992 APR	BDL	BDL	BDL	BDL	BDL
1992 JUN	BDL	IEF	BDL	BDL	BDL
1992 AUG	BDL	BDL	BDL	BDL	BDL
1992 OCT	BDL	BDL	BDL	BDL	BDL
1992 DEC	BDL	BDL	BDL	BDL	BDL
CHLOROFORM (UG/L)		DET'N LIMIT = 0.10		GUIDELINE = 350 (A1+)	
1991 JAN	BDL	4,200	2,300	2,600	2,600
1991 MAR	BDL	5,600	4,500	5,400	5,400
1991 MAY	BDL	6,500	4,400	4,800	4,800
1991 JUL	BDL	9,100	6,800	8,700	8,700
1991 SEP	BDL	16,100	12,600	14,000	14,000
1991 NOV	BDL	6,700	3,900	4,400	4,400
1992 FEB	BDL	31,200	17,600	3,600	3,600
1992 APR	BDL	7,700	7,700	BDL	BDL
1992 JUN	BDL	11,500	IEF	BDL	BDL
1992 AUG	BDL	10,800	9,000	BDL	BDL
1992 OCT	BDL	10,500	8,300	BDL	BDL
1992 DEC	BDL	8,700	4,500	BDL	BDL



TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 WALLACEBURG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM ROBERT ST FREE FLOW	DIST. SYSTEM ROBERT ST STANDING	DIST. SYSTEM THOMAS AVE FREE FLOW	DIST. SYSTEM THOMAS AVE STANDING
VOLATILES					
111, TRICHLOROETHANE (UG/L )					
		DET'N LIMIT = 0.02		GUIDELINE = 200 (01)	
1991 JAN	BDL	BDL		BDL	
1991 MAR	BDL	BDL		BDL	
1991 MAY	BDL	BDL		BDL	
1991 JUL	BDL	BDL		BDL	
1991 SEP	BDL	BDL		BDL	
1991 NOV	BDL	BDL		BDL	
1992 FEB	BDL	BDL		BDL	
1992 APR	BDL	BDL		BDL	
1992 JUN	BDL	BDL		BDL	
1992 AUG	BDL	BDL		BDL	
1992 OCT	BDL	BDL		BDL	
1992 DEC	BDL	BDL		BDL	
1,2 DICHLOROETHANE (UG/L )					
		DET'N LIMIT = 0.05		GUIDELINE = 5 (A1)	
41 SAMPLES	BDL	BDL		BDL	
CARBON TETRACHLORIDE (UG/L )					
		DET'N LIMIT = 0.20		GUIDELINE = 5 (A1)	
41 SAMPLES	BDL	BDL		BDL	
1,2-DICHLOROPROPANE (UG/L )					
		DET'N LIMIT = 0.05		GUIDELINE = 5 (01)	
41 SAMPLES	BDL	BDL		BDL	
TRICHLOROETHYLENE (UG/L )					
		DET'N LIMIT = 0.10		GUIDELINE = 50 (A1)	
41 SAMPLES	BDL	BDL		BDL	
DICHLOROBROMOMETHANE (UG/L )					
		DET'N LIMIT = 0.05		GUIDELINE = 350 (A1+)	
1991 JAN	BDL	7.800		3.600	
1991 MAR	BDL	7.200		4.250	
1991 MAY	BDL	8.650		5.150	
1991 JUL	BDL	7.900		6.400	
1991 SEP	BDL	11.000		9.250	
1991 NOV	BDL	6.750		4.150	
1992 FEB	BDL	7.550		3.650	
1992 APR	BDL	10.300			
1992 JUN	BDL	8.100		IEF	
1992 AUG	BDL	9.700		8.700	
1992 OCT	BDL	6.500		5.750	
1992 DEC	BDL	6.900		4.750	

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 WALLACEBURG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM ROBERT ST FREE FLOW	DIST. SYSTEM ROBERT ST STANDING	DIST. SYSTEM THOMAS AVE FREE FLOW	DIST. SYSTEM THOMAS AVE STANDING
VOLATILES					
112-TRICHLOROETHANE (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = 0.6 (04)	
41 SAMPLES	BDL	BDL	BDL	BDL	BDL
CHLORODIBROMOMETHANE (UG/L)		DET'N LIMIT = 0.10		GUIDELINE = 350 (A1+)	
1991 JAN	BDL	6.900	4.200	4.300	4.300
1991 MAR	BDL	4.300	2.900	2.800	2.800
1991 MAY	BDL	7.400	5.800	5.900	5.900
1991 JUL	BDL	4.300	3.900	4.000	4.000
1991 SEP	BDL	6.100	5.400	5.400	5.400
1991 NOV	BDL	3.400	2.500	2.500	2.500
1992 FEB	BDL	800 <T	.500 <T	5.300	5.300
1992 APR	BDL	8.300	IEF		
1992 JUN	BDL	4.900	7.600		
1992 AUG	BDL	7.600	3.000		
1992 OCT	BDL	3.500	3.400		
1992 DEC	BDL				
TETRACHLOROETHYLENE (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = 65 (A5)	
41 SAMPLES	BDL	BDL	BDL	BDL	BDL
BROMOFORM (UG/L)		DET'N LIMIT = 0.20		GUIDELINE = 350 (A1+)	
1991 JAN	BDL	.800 <T	.600 <T	.600 <T	.600 <T
1991 MAR	BDL	.600 <T	.600 <T	.400 <T	.400 <T
1991 MAY	BDL	1.400 <T	1.200 <T	1.200 <T	1.200 <T
1991 JUL	BDL	BDL	BDL	BDL	BDL
1991 SEP	BDL	.600 <T	.800 <T	.800 <T	.800 <T
1991 NOV	BDL	BDL	BDL	BDL	BDL
1992 FEB	BDL	BDL	BDL	BDL	BDL
1992 APR	BDL	BDL	IEF		
1992 JUN	BDL	1.600 <T	1.800 <T		
1992 AUG	BDL	BDL	BDL		
1992 OCT	BDL	.400 <T	.600 <T		
1992 DEC	BDL				
1122-TETRACHLOROETHANE (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = 0.17 (04)	
41 SAMPLES	BDL	BDL	BDL	BDL	BDL
VINYL CHLORIDE (UG/L)		DET'N LIMIT = 0.100		GUIDELINE = 2 (01)	
17 SAMPLES	BDL	BDL	BDL	BDL	BDL

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 WALLACEBURG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM ROBERT ST FREE FLOW	DIST. SYSTEM ROBERT ST STANDING	DIST. SYSTEM THOMAS AVE FREE FLOW	DIST. SYSTEM THOMAS AVE STANDING
VOLATILES					
C12-DICHLOROETHYLENE (UG/L)	)	DET'N LIMIT = 0.100		GUIDELINE = 70 (D1)	
17 SAMPLES	BDL	BDL		BDL	
CHLOROBENZENE (UG/L)	)	DET'N LIMIT = 0.10		GUIDELINE = 1510 (O3)	
41 SAMPLES	BDL	BDL		BDL	
1,4-DICHLOROBENZENE (UG/L)	)	DET'N LIMIT = 0.10		GUIDELINE = 5 (A1)	
41 SAMPLES	BDL	BDL		BDL	
1,3-DICHLOROBENZENE (UG/L)	)	DET'N LIMIT = 0.10		GUIDELINE = 3750 (O3)	
41 SAMPLES	BDL	BDL		BDL	
1,2-DICHLOROBENZENE (UG/L)	)	DET'N LIMIT = 0.05		GUIDELINE = 200 (A1)	
41 SAMPLES	BDL	BDL		BDL	
ETHYLENE DIBROMIDE (UG/L)	)	DET'N LIMIT = 0.05		GUIDELINE = 50 (D1)	
41 SAMPLES	BDL	BDL		BDL	
TOTL TRIHALOMETHANES (UG/L)	)	DET'N LIMIT = 0.50		GUIDELINE = 350 (A1)	
1991 JAN	BDL	19,550			
1991 MAR	BDL	17,800			
1991 MAY	BDL	24,050			
1991 JUL	BDL	21,300			
1991 SEP	BDL	33,800			
1991 NOV	BDL	16,850			
1992 FEB	BDL	39,550			
1992 APR	BDL	26,300			
1992 JUN	BDL	24,500			
1992 AUG	BDL	29,700			
1992 OCT	BDL	20,000			
1992 DEC	BDL	19,500			

TABLE 4  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 WALLACEBURG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM FREE FLOW	DIST. SYSTEM STANDING	DIST. SYSTEM THOMAS AVE FREE FLOW	DIST. SYSTEM THOMAS AVE STANDING
RADIONUCLIDES					
COBALT 60 (BQ/L)					
8 SAMPLES	BDL	DET'N LIMIT = 0.70	GUIDELINE = N/A		
CESIUM 134 (BQ/L)					
8 SAMPLES	BDL	DET'N LIMIT = 0.70	GUIDELINE = N/A		
CESIUM 137 (BQ/L)					
8 SAMPLES	BDL	DET'N LIMIT = 0.70	GUIDELINE = 50 (A1)		
GROSS ALPHA COUNT (BQ/L)					
1991 MAY	BDL	DET'N LIMIT = 0.04	GUIDELINE = 0.55 (D1)		
1991 SEP	BDL				
1992 JUN	BDL				
1992 AUG	BDL				
GROSS BETA COUNT (BQ/L)					
1991 MAY	.080	DET'N LIMIT = 0.04	GUIDELINE = N/A		
1991 SEP	.070				
1992 JUN	.090				
1992 AUG	.090				
TRITIUM (BQ/L)					
1991 MAY	BDL	DET'N LIMIT = 7.00	GUIDELINE = 40000 (A1)		
1991 SEP	BDL				
1992 JUN	7.000				
1992 AUG	11.000				
IODINE 131 (BQ/L)					
8 SAMPLES	BDL	DET'N LIMIT = 0.70	GUIDELINE = 10 (A1)		

TABLE 5  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992

SCAN/PARAMETER -----	UNIT ----	DETECTION LIMIT -----	GUIDELINE -----
BACTERIOLOGICAL			
FECAL COLIFORM MEMBRANE FILTRATION	CT/100ML	0	0 (A1)
STANDARD PLATE COUNT MEMBRANE FILT.	CT/ML	0	500/ML (A3)
TOTAL COLIFORM BACKGROUND MF	CT/100ML	0	N/A
TOTAL COLIFORM MEMBRANE FILTRATION	CT/100ML	0	5/100ML (A1)
CHEMISTRY (FLD)			
FIELD COMBINED CHLORINE RESIDUAL	MG/L	0	N/A
FIELD TOTAL CHLORINE RESIDUAL	MG/L	0	N/A
FIELD FREE CHLORINE RESIDUAL	MG/L	0	N/A
FIELD PH	DMNSLESS	N/A	6.5-8.5 (A4)
FIELD TEMPERATURE	DEG.C	N/A	15.0 (A3)
FIELD TURBIDITY	FTU	N/A	1.0 (A1)
CHEMISTRY (LAB)			
ALKALINITY	MG/L	0.20	30-500 (A4)
AMMONIUM TOTAL	MG/L	0.002	0.05 (F2)
CALCIUM	MG/L	0.20	100.0 (F2)
CHLORIDE	MG/L	0.20	250.0 (A3)
COLOUR	TCU	0.50	5.0 (A3)
CONDUCTIVITY	UMHO/CM	1.00	400.0 (F2)
CYANIDE	MG/L	0.001	0.2 (A1)
DISSOLVED ORGANIC CARBON	MG/L	0.10	5.0 (A3)
FLUORIDE	MG/L	0.01	1.5* (A1)
HARDNESS	MG/L	0.50	80-100 (A4)
IONCAL	DMNSLESS	N/A	N/A
LANGELIERS INDEX	DMNSLESS	N/A	N/A
MAGNESIUM	MG/L	0.10	30.0 (F2)
NITRATES (TOTAL)	MG/L	0.005	10.0 (A1)
NITRITE	MG/L	0.001	1.0 (A1)
NITROGEN TOTAL KJELDAHL	MG/L	0.02	N/A
PH	DMNSLESS	N/A	6.5-8.5 (A4)
PHOSPHORUS FIL REACT	MG/L	0.0005	N/A
PHOSPHORUS TOTAL	MG/L	0.002	0.4 (F2)
POTASSIUM	MG/L	0.010	10.0 (F2)
RESIDUE FILTRATE (CALCULATED TDS)	MG/L	N/A	500.0 (A3)
SODIUM	MG/L	0.20	200.0 (A4)
SULPHATE	MG/L	0.20	500.0 (A4)
TURBIDITY	FTU	0.05	1.0 (A1)
* The Maximum Acceptable Concentration (MAC) for <u>naturally occurring fluoride</u> in drinking water is 2.4 mg/L.			
CHLOROAROMATICS			
1,2,3-TRICHLOROBENZENE	NG/L	5.0	N/A
1,2,3,4-TETRACHLOROBENZENE	NG/L	1.0	N/A
1,2,3,5-TETRACHLOROBENZENE	NG/L	1.0	N/A
1,2,4-TRICHLOROBENZENE	NG/L	5.0	10000 (1)
1,2,4,5-TETRACHLOROBENZENE	NG/L	1.0	38000 (D4)
1,3,5-TRICHLOROBENZENE	NG/L	5.0	N/A
2,3,6-TRICHLOROTOLUENE	NG/L	5.0	N/A
2,4,5-TRICHLOROTOLUENE	NG/L	5.0	N/A
2,6A-TRICHLOROTOLUENE	NG/L	5.0	N/A
HEXACHLOROBENZENE (HCB)	NG/L	1.0	10 (C1)
HEXACHLOROBUTADIENE	NG/L	1.0	450 (D4)
HEXACHLOROETHANE	NG/L	1.0	1900 (D4)
OCTACHLOROSTYRENE	NG/L	1.0	N/A
PENTACHLOROBENZENE	NG/L	1.0	74000 (D4)
CHLOROPHENOLS			
2,3,4-TRICHLOROPHENOL	NG/L	100.0	N/A
2,3,4,5-TETRACHLOROPHENOL	NG/L	20.0	N/A
2,3,5,6-TETRACHLOROPHENOL	NG/L	10.0	N/A

TABLE 5  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
2,4,5-TRICHLOROPHENOL	NG/L	100.0	2600000 (D4)
2,4,6-TRICHLOROPHENOL	NG/L	20.0	5000 (A1)
PENTACHLOROPHENOL	NG/L	10.0	60000 (A1)
METALS			
ALUMINUM	UG/L	0.10	100 (A4)
ANTIMONY	UG/L	0.05	146 (D4)
ARSENIC	UG/L	0.10	25 (A1)
BARIUM	UG/L	0.05	1000 (A2)
BERYLLIUM	UG/L	0.05	6800 (D4)
BORON	UG/L	2.00	5000 (A1)
CADMIUM	UG/L	0.05	5 (A1)
CHROMIUM	UG/L	0.50	50 (A1)
COBALT	UG/L	0.02	N/A
COPPER	UG/L	0.50	1000 (A3)
IRON	UG/L	6.00	300 (A3)
LEAD	UG/L	0.05	10 (A1)
MANGANESE	UG/L	0.05	50 (A3)
MERCURY	UG/L	0.02	1 (A1)
MOLYBDENUM	UG/L	0.05	N/A
NICKEL	UG/L	0.20	350 (D3)
SELENIUM	UG/L	1.00	10 (A1)
SILVER	UG/L	0.05	N/A
STRONTIUM	UG/L	0.10	N/A
THALLIUM	UG/L	0.05	13 (D4)
TITANIUM	UG/L	0.50	N/A
URANIUM	UG/L	0.05	100 (A1)
VANADIUM	UG/L	0.05	N/A
ZINC	UG/L	0.20	5000 (A3)
POLYNUCLEAR AROMATIC HYDROCARBONS			
ANTHRACENE	NG/L	1.0	N/A
BENZO(A) ANTHRACENE	NG/L	20.0	N/A
BENZO(A) PYRENE	NG/L	5.0	10 (A1)
BENZO(B) CHRYSENE	NG/L	2.0	N/A
BENZO(B) FLUORANTHENE	NG/L	10.0	N/A
BENZO(E) PYRENE	NG/L	50.0	N/A
BENZO(G,H,I) PERYLENE	NG/L	20.0	N/A
BENZO(K) FLUORANTHENE	NG/L	1.0	N/A
CHRYSENE	NG/L	50.0	N/A
CORONENE	NG/L	10.0	N/A
DIBENZO(A,H) ANTHRACENE	NG/L	10.0	N/A
DIMETHYL BENZO(A) ANTHRACENE	NG/L	5.0	N/A
FLUORANTHENE	NG/L	20.0	42000 (D4)
INDENO(1,2,3-C,D) PYRENE	NG/L	20.0	N/A
PERYLENE	NG/L	10.0	N/A
PHENANTHRENE	NG/L	10.0	N/A
PYRENE	NG/L	20.0	N/A
PESTICIDES & PCB			
ALACHLOR (LASSO)	NG/L	500.0	5000 (A2)
ALDRIN	NG/L	1.0	700 (A1)
ALPHA HEXACHLOROCYCLOHEXANE (BHC)	NG/L	1.0	700 (G)
ALPHA CHLORDANE	NG/L	2.0	7000 (A1)
AMETRINE	NG/L	50.0	300000 (D3)
ATRATONE	NG/L	50.0	N/A
ATRAZINE	NG/L	50.0	60000 (A2)
DESETHYL ATRAZINE	NG/L	200.0	60000 (A2)
BETA HEXACHLOROCYCLOHEXANE (BHC)	NG/L	1.0	300 (G)
CYANAZINE (BLADEX)	NG/L	100.0	10000 (A2)
DIELDRIN	NG/L	2.0	700 (A1)
ENDOSULFAN 1 (THIODAN I)	NG/L	2.0	74000 (D4)
ENDOSULFAN 2 (THIODAN II)	NG/L	5.0	74000 (D4)
ENDOSULFAN SULPHATE (THIODAN SULPHATE)	NG/L	5.0	N/A

TABLE 5  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
ENDRIN	NG/L	5.0	1600 (D3)
GAMMA CHLORDANE	NG/L	2.0	7000 (A1)
HEPTACHLOR	NG/L	1.0	3000 (A1)
HEPTACHLOR EPOXIDE	NG/L	1.0	3000 (A1)
HEXACHLOROCYCLOPENTADIENE	NG/L	5.0	206000 (D4)
LINDANE (GAMMA BHC)	NG/L	1.0	4000 (A1)
METHOXYCHLOR	NG/L	5.0	900000 (A1)
METOLACHLOR	NG/L	500.0	50000 (A2)
METRIBUZIN (SENCOR)	NG/L	100.0	80000 (A1)
MIREX	NG/L	5.0	N/A
P,P-DDD	NG/L	5.0	30000 (A1)
O,P-DDT	NG/L	5.0	30000 (A1)
P,P-DDT	NG/L	5.0	30000 (A1)
P,P-DDE	NG/L	1.0	30000 (A1)
OXYCHLORDANE	NG/L	2.0	N/A
PCB	NG/L	20.0	3000 (A2)
PROMETONE	NG/L	50.0	52500 (D3)
PROMETRYNE	NG/L	50.0	1000 (A2)
PROPAZINE	NG/L	50.0	700000 (D3)
SIMAZINE	NG/L	50.0	10000 (A2)
DESETHYL SIMAZINE	NG/L	200.0	10000 (A2)
TOXAPHENE	NG/L	500.0	5000 (A1)
PHENOLICS			
PHENOLICS (UNFILTERED REACTIVE)	UG/L	0.2	N/A
SPECIFIC PESTICIDES			
2,4 D PROPIONIC ACID	NG/L	100.0	N/A
2,4,5-TRICHLOROPHENOXY ACETIC ACID	NG/L	50.0	280000 (A1)
2,4-DICHLOROBUTYRIC ACID (2,4-D)	NG/L	100.0	100000 (A1)
2,4-DICHLOROPHENOXYBUTYRIC ACID (2,4-DB)	NG/L	200.0	N/A
2,4,5-TP (SILVEX)	NG/L	20.0	10000 (A1)
BUTYLATE (SUTAN)	NG/L	2000.0	245000 (D3)
CARBARYL (SEVIN)	NG/L	200.0	90000 (A1)
CARBOFURAN	NG/L	2000.0	90000 (A1)
CHLORPROPHAM (CIPC)	NG/L	2000.0	350000 (G)
CHLORPYRIFOS (DURSBAN)	NG/L	20.0	N/A
DIALLATE	NG/L	2000.0	N/A
DIAZINON	NG/L	20.0	20000 (A1)
DICAMBA	NG/L	50.0	120000 (A1)
DICHLOROVOS	NG/L	20.0	N/A
EPTAM	NG/L	2000.0	N/A
ETHION	NG/L	20.0	35000 (G)
IPC	NG/L	2000.0	N/A
MALATHION	NG/L	20.0	190000 (A1)
METHYL PARATHION	NG/L	50.0	9000 (D3)
METHYLTRITHION	NG/L	20.0	N/A
MEVINPHOS	NG/L	20.0	N/A
PARATHION	NG/L	20.0	50000 (A1)
PHORATE (THIMET)	NG/L	20.0	2000 (A2)
PICHLORAM	NG/L	100.0	190000 (A2)
PROPOXUR (BAYGON)	NG/L	2000.0	140000 (D3)
RELDAN	NG/L	20.0	N/A
RONNEL	NG/L	20.0	N/A
VOLATILES			
1,1-DICHLOROETHANE	UG/L	0.10	N/A
1,1-DICHLOROETHYLENE	UG/L	0.10	7 (D1)
1,2-DICHLOROBENZENE	UG/L	0.05	200 (A1)
1,2-DICHLOROETHANE	UG/L	0.05	5 (A1)
1,2-DICHLOROPROPANE	UG/L	0.05	5 (D1)
1,3-DICHLOROBENZENE	UG/L	0.10	3750 (D3)
1,4-DICHLOROBENZENE	UG/L	0.10	5 (A1)
1,1,1-TRICHLOROETHANE	UG/L	0.02	200 (D1)
1,1,2-TRICHLOROETHANE	UG/L	0.05	0.6 (D4)
1,1,2,2-TETRACHLOROETHANE	UG/L	0.05	0.17 (D4)

TABLE 5  
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
BENZENE	UG/L	0.05	5 (A1)
BROMOFORM	UG/L	0.20	350 (A1+)
CARBON TETRACHLORIDE	UG/L	0.20	5 (A1)
CHLOROBENZENE	UG/L	0.10	1510 (D3)
CHLORODIBROMOMETHANE	UG/L	0.10	350 (A1+)
CHLOROFORM	UG/L	0.10	350 (A1+)
CIS 1,2-DICHLOROETHYLENE	UG/L	0.10	70 (D1)
DICHLOROBROMOMETHANE	UG/L	0.05	350 (A1+)
ETHYLENE DIBROMIDE	UG/L	0.05	50 (D1)
ETHYLBENZENE	UG/L	0.05	2.4 (A3)
M-XYLENE	UG/L	0.10	300 (A3*)
METHYLENE CHLORIDE	UG/L	0.50	50 (A1)
O-XYLENE	UG/L	0.05	300 (A3*)
P-XYLENE	UG/L	0.10	300 (A3*)
STYRENE	UG/L	0.05	100 (D1)
TETRACHLOROETHYLENE	UG/L	0.05	65 (A5)
TRANS 1,2-DICHLOROETHYLENE	UG/L	0.10	70 (D1)
TOLUENE	UG/L	0.05	24 (A3)
TOTAL TRIHALOMETHANES	UG/L	0.50	350 (A1)
TRICHLOROETHYLENE	UG/L	0.10	50 (A1)
VINYL CHLORIDE	UG/L	0.10	2 (D1)
RADIONUCLIDES			
TRITIUM	BQ/L	7.0	40000 (A1)
GROSS ALPHA COUNT	BQ/L	0.04	0.55# (D1)
GROSS BETA COUNT	BQ/L	0.04	N/A
COBALT 60	BQ/L	0.70	N/A
CESIUM 134	BQ/L	0.70	N/A
CESIUM 137	BQ/L	0.70	50 (A1)
IODINE 131	BQ/L	0.70	10 (A1)

# Equal to 15.0 Picocuries/litre



DRINKING WATER SURVEILLANCE PROGRAM  
PROGRAM DESCRIPTION

The Drinking Water Surveillance Program (DWSP) for Ontario monitors drinking water quality at municipal water supply systems. The DWSP Database Management System provides a computerized drinking water quality information system for the supplies monitored. The objectives of the program are to provide:

- immediate, reliable, current information on drinking water quality;
- a flagging mechanism for guideline exceedance;
- a definition of contaminant levels and trends;
- a comprehensive background for remedial action;
- a framework for assessment of new contaminants; and
- an indication of treatment efficiency of plant processes.

PROGRAM

The DWSP officially began in April 1986 and is designed to eventually include all municipal water supplies in Ontario. In 1992, 109 systems were being monitored. Water supply locations have been prioritized for surveillance based primarily on criteria such as population density, probability of contamination and geographical location.

An ongoing assessment of future monitoring requirements at each location will be made. Monitoring will continue at the initial locations at an appropriate level and further locations will be phased into the program as resources permit.

A major goal of the program is to collect valid water quality data in context with plant operational characteristics at the time of sampling. As soon as sufficient data have been accumulated and analyzed, both the frequency of sampling and the range of parameters may be adjusted accordingly.

Assessments are carried out at all locations prior to initial sampling, in order to acquire complete plant process and distribution system details and to designate (and retrofit if necessary) all sampling systems and locations. This ensures that the sampled water is a reflection of the water itself.

Samples are taken of raw (ambient water) and treated water at the treatment plant and of consumer's tap water in the distribution system. In order to determine possible effects of distribution on water quality, both standing and free flow water in old and new sections of the distribution system are sampled. Sampling is carried out by operational personnel who have been trained in applicable procedures.

Comprehensive standardized procedures and field test kits are supplied to sampling personnel. This ensures that samples are taken and handled according to standard protocols and that field testing will supply reliable data. All field and laboratory analyses are carried out using "approved documented procedures". Most laboratory analyses are carried out by the Ministry of Environment and Energy (MOEE), Laboratory Services Branch. Radionuclides are analyzed by the Ministry of Labour.

## DATA REPORTING MECHANISM

When the analytical results are transferred from the MOEE laboratory into the DWSP system, printouts of the completed analyses are sent to the MOEE District Officer, the appropriate operational staff and are also retained by the DWSP unit.

## PROGRAM INPUTS AND OUTPUTS

There are four major inputs and four major outputs in the program.

### Program Input - Plant and Distribution System Description

The system description includes plant specific non-analytical information acquired through a questionnaire and an initial plant visit. During the initial assessment of the plant and distribution system, questionnaire content is verified and missing information added. It is intended that all data be kept current with scheduled annual updates.

The Plant and Distribution System Description consists of the following seven components:

#### 1. PROCESS COMPONENT INVENTORY

All physical and chemical processes to which the water is subjected, from the intake pipe to the consumers' tap (where possible), are documented. These include: process type, general description of physical structures, material types, sizes, and retention time for each process within the plant. The processes may be as simple as transmission or as complex as carbon adsorption.

#### 2. TREATMENT CHEMICALS

Chemicals used in the treatment processes, their function, application point, supplier and brand-name are recorded. Chemical dosages applied on the day of sampling are recorded in DWSP.

#### 3. PROCESS CONTROL MEASUREMENTS

Documentation of in-plant monitoring of process parameters (eg. turbidity, chlorine residuals, pH, aluminum residuals) including methods used, monitoring locations and frequency is contained in this section. Except for the recorded Field Data, in-plant monitoring results are not retained in DWSP but are retained by the water treatment plant personnel.

#### 4. DESIGN FLOW AND RETENTION TIME

Hydraulic capacity, designed and actual, is noted here. Retention time (the time that a block of water is retained in the plant) is also noted. Maximum, minimum and average flow, as well as a record of the flow rate on the day of sampling, are recorded in DWSP.

#### 5. DISTRIBUTION SYSTEM DESCRIPTION

This area includes the storage and transmission characteristics of the distribution system after the water leaves the plant.

## 6. SAMPLING SYSTEM

Each plant is assessed for its adequacy in terms of the sampling of bacteriological, organic and inorganic parameters. Prime considerations in the assessment and design of the sampling system are:

- i/ the sample is an accurate representation of the actual water condition, eg. raw water has had no chemical treatment;
- ii/ the water being sampled is not being modified by the sampling system;
- iii/ the sample tap must be in a clean area of the plant, preferably a lab area; and
- iv/ the sample lines must be organically inert (no plastic, ideally stainless steel).

It is imperative that the sampled water be a reflection not of the sampling system but of the water itself.

The sampling system documentation includes: origin of the water; date sampling was initiated; size, length and material type (intake, discharge and tap); pump characteristics (model, type, capacity); and flow rate.

## 7. PERSONNEL

This section contains the names, addresses and phone numbers of current plant management and operational staff, distribution system management and operational staff, Medical Officer of Health and appropriate MOEE personnel associated with the plant.

### Program Input - Field Data

The second major input to DWSP is field data. Field data is collected at the plant and from the distribution system sites on the day of sampling. Field data consists of general operating conditions and the results of testing for field parameters. General operating conditions include chemicals used, dosages, flow and retention time on the day of sampling, as well as, monthly maximum, minimum and average flows. Field parameters include turbidity, chlorine residuals (free, combined and total), temperature and pH. These parameters are analyzed according to standardized DWSP protocols to allow for interplant comparison.

### Program Input - Laboratory Analytical Data

The third major input to DWSP is Laboratory Analytical Data. Samples gathered from the raw, treated and distribution sampling sites are analyzed for the presence of approximately 180 parameters at a frequency of two to twelve times per year. Sixty-five percent of the parameters are organic. Parameters measured may have health or aesthetic implications when present in drinking water. Many of the parameters may be used in the treatment process or may be treatment by-products. Due to the nature of certain analytical instruments, parameters may be measured in a "scan" producing some results for parameters that are not on the DWSP priority list, but which may be of interest. The majority of parameters are measured on a routine basis. Those that are technically more difficult and/or costly to analyze, however, are done less frequently. These include Specific Pesticides and Chlorophenols.

Although the parameter list is extensive, additional parameters with the potential to cause health or aesthetic related problems may be added provided reliable analytical and sampling methods exist.

All laboratory generated data is derived from standardized, documented analytical protocols. The analytical method is an integral part of the data and as methods change, notation will be made and comparison data documented.

#### Program Input - Parameter Reference Information

The fourth major input to DWSP is Parameter Reference Information. This is a catalogue of information for each substance analyzed on DWSP. It includes parameter name and aliases, physical and chemical properties, basic toxicology, world-wide health limits, treatment methods and uses. The Parameter Reference Information is computerized and can be accessed through the Query function of the DWSP database. An example is shown in figure 1.

#### Program output - Query

All DWSP information is easily accessed through the Query function, therefore, anything from addresses of plant personnel to complete water quality information for a plant's water supply is instantly available. The DWSP computer system makes relatively complex inquiries manageable. A personal password allowing access into the DWSP query mode in all MOEE offices is being developed by the DWSP group.

#### Program Output - Action Alerts

Drinking Water quality in Ontario is evaluated against provincial objectives as outlined in the Ontario Drinking Water Objectives publication. Should the reported level of a substance in treated water exceed the Ontario Drinking Water Objective, an "Action Alert" requiring resampling and confirmation is issued. This assures that operational staff, health authorities and the public are notified as soon as possible of the confirmation of an exceedance and remedial action taken. This report supplies a history of the occurrence of past exceedances at the plant plus a historical summary on the parameter of concern.

In the absence of Ontario Drinking Water Objectives, guidelines/limits from other agencies are used. The Parameter Listing System, published by MOEE (ISBN 0-7729-4461-X), catalogues and keeps current guidelines for 650 parameters from agencies throughout the world. If these guidelines are exceeded, the results are flagged and evaluated by DWSP personnel. An "Action Alert" will be issued if warranted.

#### Program Output - Report Generation

Custom reports can be generated from DWSP to meet MOEE Regional needs and to respond to public requests.

#### Program Output - Annual Reports

It is the practice of DWSP to produce an annual report containing analytical data along with companion plant information.

FIG.1

## PARAMETER REFERENCE INFORMATION

**NAME:** BENZENE

**CAS#:** 71-43-2

**MOLECULAR FORMULAE:**  $C_6H_6$

**DETECTION LIMIT:** (FOR METHOD POCODO) 0.05  $\mu\text{g/L}$

**SYNONYMS:** BENZOL; BENZOLE; COAL NAPHTHA; CARBON OIL (27)  
CYCLOHEXATRIENE (41)

**CHARACTERISTICS:** COLOURLESS TO LIGHT-YELLOW, MOBILE, NONPOLAR LIQUID, OF HIGHLY REFRACTIVE NATURE, AROMATIC ODOUR; VAPOURS BURN WITH SMOKING FLAME (30)

**PROPERTIES:** SOLUBILITY IN WATER: 1780-1800 mg/L AT 25C (41)  
THRESHOLD ODOUR: 0.5 - 10 PPM IN WATER  
THRESHOLD TASTE: 0.5 mg/L IN WATER (39)  
ENVIRONMENTAL FATE: MAY BIOACCUMULATE IN LIVING ORGANISMS AND APPEARS TO ACCUMULATE IN ANIMAL TISSUES THAT EXHIBIT A HIGH LIPID CONTENT OR REPRESENT MAJOR METABOLIC SITES, SUCH AS LIVER OR BRAIN; SMALL QUANTITIES EVAPORATE FROM SOILS OR ARE DEGRADED RATHER QUICKLY (80)

**SOURCES:** COMMERCIAL: PETROLEUM REFINING; SOLVENT RECOVERY; COAL TAR DISTILLATION (39); FOOD PROCESSING AND TANNING INDUSTRIES; COMBUSTION OF CAR EXHAUST.  
ENVIRONMENTAL: POSSIBLE SOURCE IS RUNOFF.

**USES:** DETERGENTS; NYLON; INTERMEDIATE IN PRODUCTION OF OTHER COMPOUNDS, SUCH AS PESTICIDES; SOLVENT FOR EXTRACTION AND RECTIFICATION IN RUBBER INDUSTRY; DEGREASING AND CLEANSING AGENT; GASOLINE.

**REMOVAL:** THE FOLLOWING PROCESSES HAVE BEEN SUCCESSFUL IN REMOVING BENZENE FROM WASTEWATER: GAC ADSORPTION, PRECIPITATION WITH ALUM AND SUBSEQUENT REMOVAL VIA SEDIMENTATION, COAGULATION AND FLOCCULATION, SOLVENT EXTRACTION, OXIDATION

**ADDITIONAL PROPERTIES:** MOLECULAR WEIGHT: 78.12  
MELTING POINT: 5.5°C (27)  
BOILING POINT: 80.1°C (27)  
SPECIFIC GRAVITY: 0.8790 AT 20°C (27)  
VAPOUR PRESSURE: 100 MM AT 26.1°C (27)  
HENRY'S LAW CONSTANT: 0.00555 ATM-M<sup>3</sup>/MOLE (41)  
LOG OCT./WATER PARTITION COEFFICIENT: 1.95 TO 2.13 (39)  
CARBON ADSORPTION: K=1.0; 1/N=1.6; R=0.97; PH=5.3 (41)  
SEDIMENT/WATER PARTITION COEFFICIENT: NO DATA

## Appendix B

### DWSP SAMPLING GUIDELINE

#### i) Raw and Treated at Plant

General Chemistry	-500 mL plastic bottle (PET 500) -rinse bottle and cap with sample water three times -fill to 2 cm from top
Bacteriological	-220 mL plastic bottle with white seal on cap -do <u>not</u> rinse bottle, preservative has been added -avoid touching bottle neck or inside of cap -fill to top of red label as marked
Metals	-500 mL plastic bottle (PET 500) -rinse bottle and cap three times -fill to 2 cm from top -add 10 drops nitric acid ( $\text{HNO}_3$ ) (Caution: $\text{HNO}_3$ is corrosive)
Volatiles (duplicates) (OPOPUP)	-45 mL glass vial with septum (teflon side must be in contact with sample) -do <u>not</u> rinse bottle -fill bottle completely without bubbles
Organics (OWOC), (OWTRI)	-1 L amber glass bottle per scan -do <u>not</u> rinse bottle -fill to 2 cm from top
Specific Pesticides (OWCP), (PEOP), (PECAR)	-as per Organics -three extra bottles must be filled
Polyaromatic hydrocarbons (OAPAHX)	-1 L amber glass bottle per scan -do <u>not</u> rinse bottle -fill to 2 cm from top -add 25 drops of sodium thiosulphate
Cyanide (Treated only)	-500 mL plastic bottle (PET 500) -rinse bottle and cap three times -fill to 2 cm from top -add 10 drops sodium hydroxide ( $\text{NaOH}$ ) (Caution: $\text{NaOH}$ is corrosive)
Mercury	-250 mL glass bottle -rinse bottle and cap three times -fill to top of label -add 20 drops each nitric acid ( $\text{HNO}_3$ ) and potassium dichromate ( $\text{K}_2\text{Cr}_2\text{O}_7$ ) (Caution: $\text{HNO}_3$ & $\text{K}_2\text{Cr}_2\text{O}_7$ are corrosive)

Phenols	-250 mL glass bottle -do <u>not</u> rinse bottle, preservative has been added -fill to top of label
Radionuclides (as scheduled)	-4 L plastic jug -do <u>not</u> rinse, carrier added -fill to 5 cm from top
Organic Characterization (GC/MS - once per year) (PBVOL), (PBEXT)	-1 L amber glass bottle; instructions as per organic -250 mL glass bottle -do <u>not</u> rinse bottle -fill completely without bubbles

Steps:

1. Let sampling water tap run for an adequate time to clear the sample line.
2. Record time of day on submission sheet.
3. Record temperature on submission sheet.
4. Fill up all bottles as per instructions.
5. Record chlorine residuals (free, combined and total for treated water only), turbidity and pH on submission sheet.
6. No smoking in area of sample location.

ii) Distribution Samples (standing water)

General Chemistry	-500 mL plastic bottle (PET 500) -rinse bottle and cap with sample water three times -fill to 2 cm from top
Metals	-500 mL plastic bottle (PET 500) -rinse bottle and cap three times -fill to 2 cm from top -add 10 drops nitric acid ( $\text{HNO}_3$ ) (Caution: $\text{HNO}_3$ is corrosive)

Steps:

1. Record time of day on submission sheet.
2. Place bucket under tap and open cold water.
3. Fill to predetermined volume.
4. After mixing the water, record the temperature on the submission sheet.

5. Fill general chemistry and metals bottles.

6. Record chlorine residuals (free, combined and total), turbidity and pH on submission sheet.

iii) Distribution Samples (free flow)

General Chemistry	-500 mL plastic bottle (PET 500) -rinse bottle and cap with sample water three times -fill to 2 cm from top
Bacteriological	-250 mL plastic bottle with white seal on cap -do <u>not</u> rinse bottle, preservative has been added -avoid touching bottle neck or inside of cap -fill to top of red label as marked
Metals	-500 mL plastic bottle (PET 500) -rinse bottle and cap three times -fill to 2 cm from top -add 10 drops nitric acid $\text{HNO}_3$ (Caution: $\text{HNO}_3$ is corrosive)
Volatiles (duplicate) (OPOPUP)	-45 mL glass vial with septum (teflon side must be in contact with sample) -do <u>not</u> rinse bottle, preservative has been added -fill bottle completely without bubbles
Organics (OWOC)	-1 L amber glass bottle per scan -do <u>not</u> rinse bottle -fill to 2 cm from top
Polyaromatic Hydrocarbons (OAPAHX)	-1 L amber glass bottle per scan -do <u>not</u> rinse bottle -fill to 2 cm from top -add 25 drops of sodium thiosulphate

Steps:

1. Record time of day on submission sheet.

2. Let cold water flow for five minutes.

3. Record temperature on submission sheet.

4. Fill all bottles as per instructions.

5. Record chlorine residuals (free, combined and total), turbidity and pH on submission sheet.





